

Drawing Curve and Shapes

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About lines, curves and shapes

When you want to draw vector shapes and curves you'll need to use the [Pen](#), [Pencil](#), [Vector Brush](#) and [shape](#) tools. Editing curves and shapes is done with the [Node](#) tool or the **Ctrl** key as you draw.

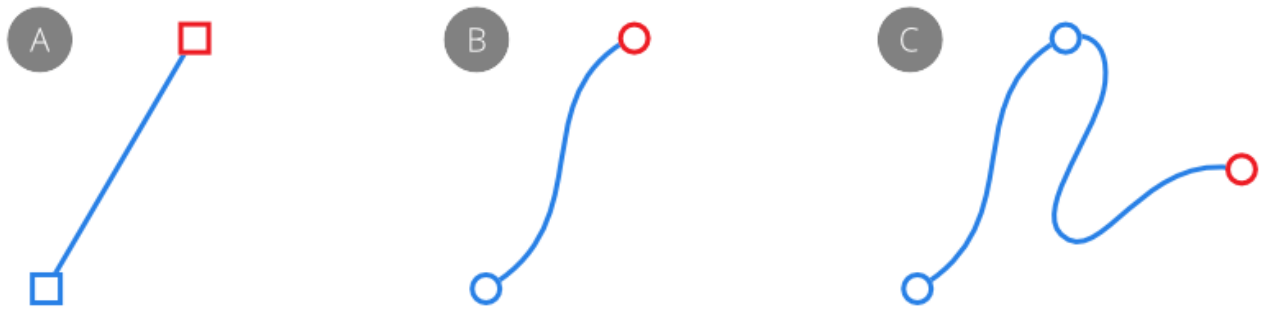


 Curves and shapes have both stroke and fill properties. These can be defined before creation and can be modified at any point afterwards.

Curves and lines

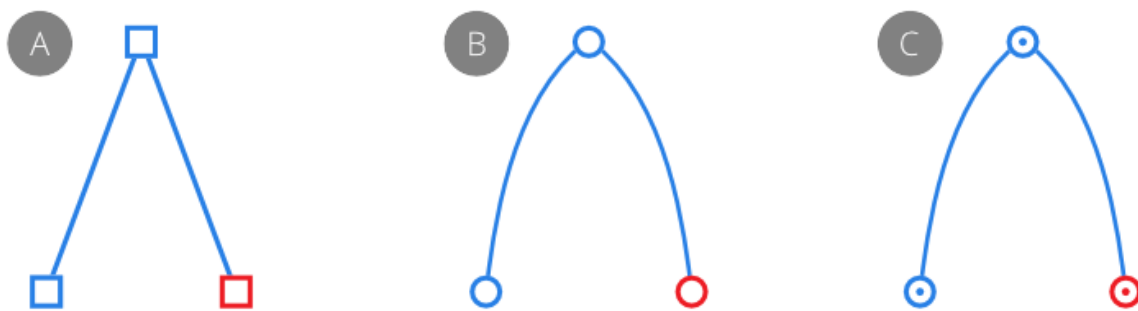
A curve is an **open** path that has a distinct start and end. These end stops are defined by **nodes**. A curve with just two nodes is referred to as a **line**.

The path between nodes is known as a **segment** and can be straight (A) or arched (B). Complex curves are created from multiple nodes connected by segments (C). Lines and curves generally have a stroke applied.

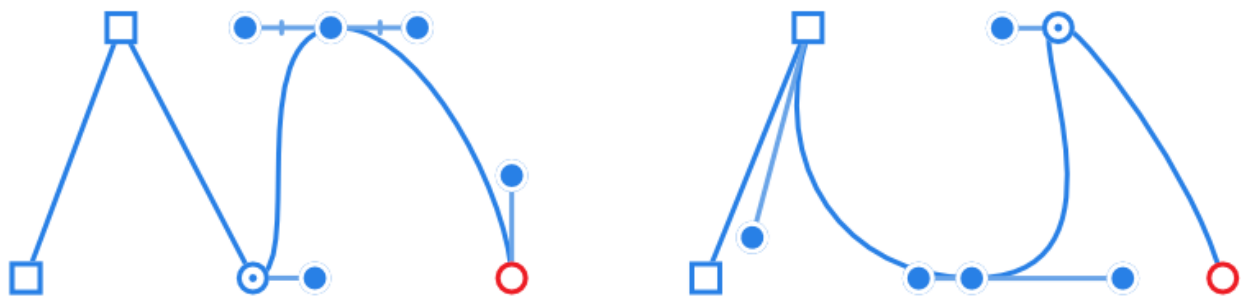


The type of node controls the connected segments. There are three basic types of node:

- Sharp (A)—causes an abrupt change in direction between segments, creating a point.
- Bézier (smooth) (B)—creates a continuous curve between segments.
- Smart (C)—creates a continuous curve but uses a line of best fit.

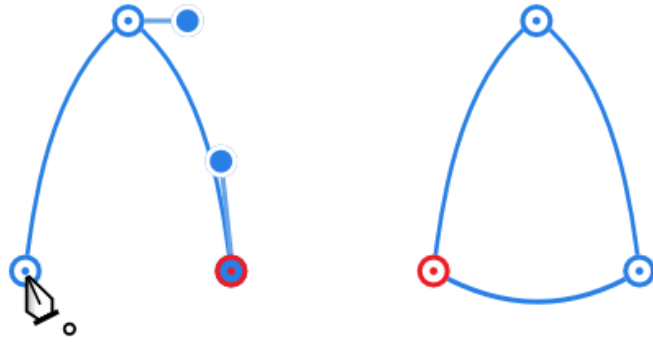


When drawing curves, any combination of nodes can be used. Each node also has **control handles**. These appear when the node is selected. The length and slope of the control handles determine the shape of the segment. A node can be edited at any time.



Shapes

A shape is a **closed** path with no discernible start or end. It is made up of multiple nodes and segments.



You can also easily create geometric shapes using the [Shape tools](#). These have special properties that enable you to quickly create otherwise difficult to draw shapes, such as circles, rectangles and polygons.

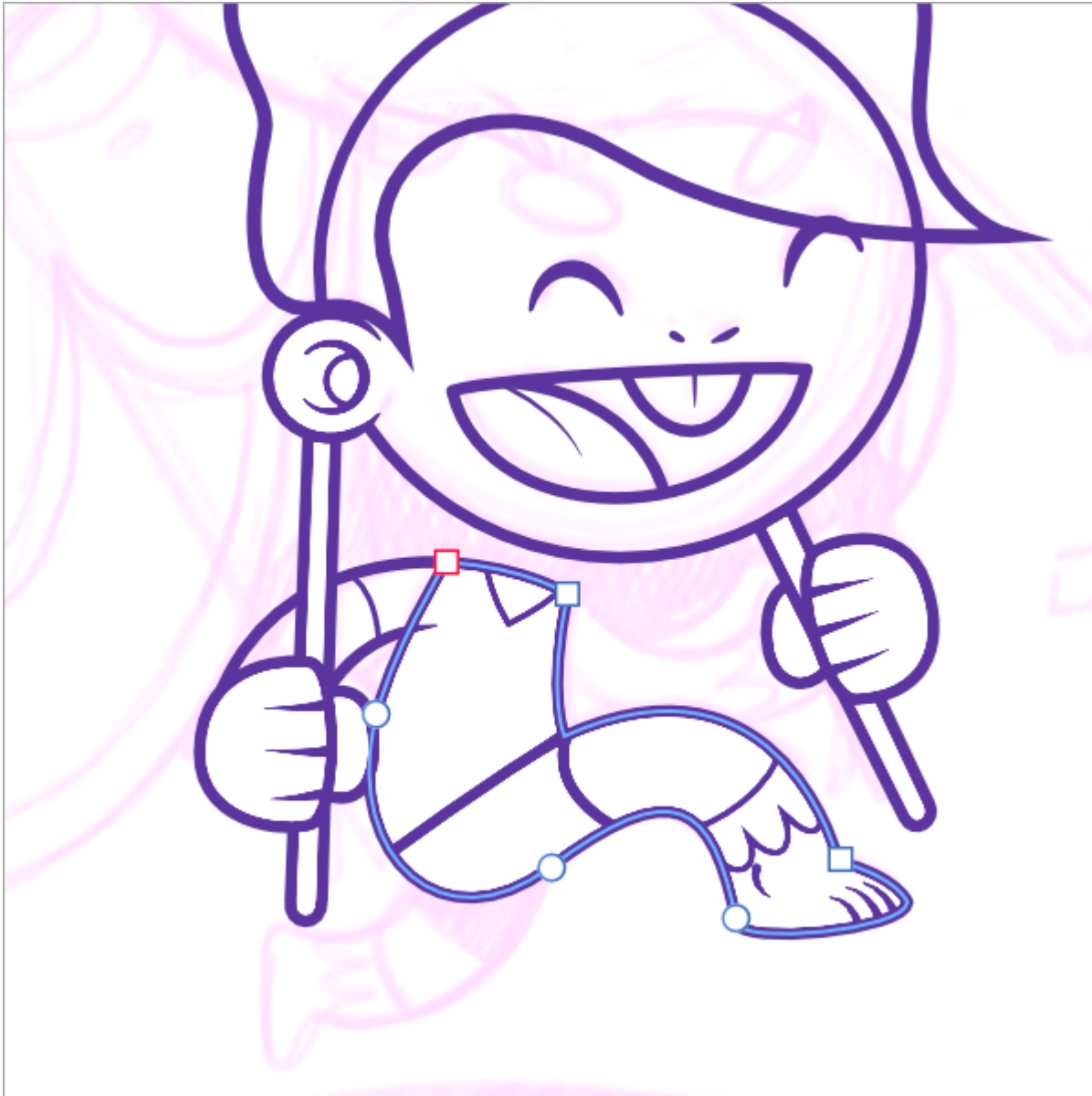
SEE ALSO:

[Edit curves and shapes](#)

[Draw and edit shapes](#)

Draw curves and shapes

Curves and shapes are easily created using the Pen Tool. The Pen Tool has several modes that change the way the path is drawn.



▼ To draw precise curves with the Pen Tool:

1. Select the **Pen Tool**.
2. On the context toolbar, select a **Mode**:
 -  **Pen Mode**—click-drag on the page to create repeated nodes; repositioning the displayed off-curve control handles at each node defines the shape of the next segment as you lay down nodes.

-  **Smart Mode**—click repeatedly on the page to lay down each node; a best fitting curve is created without need for control handle adjustment.
 -  **Polygon Mode**—click repeatedly on the page to lay down each node; a line is created with sharp nodes made up of straight segments.
 -  **Line Mode**—click and drag on the page to create a simple single-segment straight line that self-terminates.
3.   Enable **Use line style** to edit the outer line of the shape drawn via the **Stroke** panel, or **Use fill** to automatically fill the concave area created by the curve with the current fill color.
4. To complete the curve without closing it, press the **Esc** key. To close the curve, click on the starting node.

 To draw a straight line of a specific rotation and/or length, with a single uncurved line selected using the **Move Tool**, on the **Transform** panel, adjust the **Rotation** and/or **Length** values.

 Other context toolbar options can be used *in conjunction* with any one of the four modes above:

-  **Preserve Selection When Creating New Curves**—when enabled, it keeps the previously drawn curve(s) selected so that their nodes and geometry can be more easily snapped to as you draw.
-  **Add New Curve to Selected curves object**—when enabled, the mode creates additional curves on the same layer as the initial curve—this gives better management of a multitude of curve layers. For example, the character 'a' is made up of two curves that can be a single 'curve object'. From **Layer>Geometry**, choose **Separate Curves** to separate each curve into separate layers or **Merge Curves** to consolidate selected curves into one layer.
-  **Rubber Band Mode**—when enabled, it previews the next segment to be drawn before placement of the new leading node.

A number of cursor types may appear when using this tool, indicating the outcome of the next click.

Cursor type	Description
	Asterisk—creates a new curve
	Plus—creates a new node and curve segment

	Slope—converts to sharp corner or drag to recreate node
	Circle—creates a closed shape
	Circled asterisk—creates a new curve from an existing curve's node.
	Circled plus—creates a new node overlapping an existing curve's node.

▼ To continue an existing curve:

1. Press the **Ctrl** key to edit curve or select the curve with the **Node Tool**.
2. Place the cursor over the final node on the path that you want to continue.
3. Click once to select the node.
4. Release the **Ctrl** key (or select **Pen Tool**) and click/drag to place new nodes as needed. This can be placed over an existing node on the same curve, creating coincidental overlapping nodes.

▼ To change a curve or shape's stroke width:

Do one of the following:

- On the **Stroke** panel, adjust the **Width** via slider or input absolute values, expressions and formulas (percentages).
- Use the [or] keys (decrease or increase width, respectively) as you draw or edit a curve.

▼ To close curves to create a custom shape:

Do one of the following:

- With the curve selected with the **Pen** or **Node Tool**, click **Close Curve** on the context toolbar.
- When creating the curve with the Pen Tool, click on the starting node to join it to the final node and create the shape.



Modifier keys

When using the Pen Tool, the following modifier keys can be used to speed up the workflow as you draw:

- The **Ctrl** key temporarily activates the Node Tool.
- The **Shift** key constrains control handles to 45° intervals in Pen Mode. In Smart Mode, node positioning is constrained instead.
- The **Alt** key forces the node into cusp mode.

- Pressing the **Spacebar** while clicking and dragging lets you reposition the last drawn node without affecting control handle position which maintains curvature in and out of the node.

For Pen Tool, Node and shape tools, the following modifier keys can be used as you draw or when editing the object:

- To decrease or increase stroke width by percentage, use the [or] keys, respectively. For smaller absolute increments instead, use an additional **Shift** key modifier.

SEE ALSO:

[Draw and edit shapes](#)

[Edit curves and shapes](#)

[Arrowheads](#)

[Dot/dash line styles](#)

[Texture line styles](#)

[Pen Tool](#)

[Pencil Tool](#)

[Node Tool](#)

[Pressure sensitivity](#)

[Stroke panel](#)

[Keyboard shortcuts for curve drawing operations](#)

Edit curves and shapes

Curves and shapes are easily edited using either:

- The **Ctrl** key as you draw your curve or shape with the **Pen Tool**.
- The  **Node Tool**.

Use the former for fine tuning and curve adjustment as you draw, the latter for more prolonged editing operations.



You can quickly change between the **Move Tool** and the **Node Tool** to speed up your workflow. With the Move Tool active, double-clicking on a shape will enable the Node Tool, which can be then used to edit that shape. Double-click on the shape again to reactivate the Move Tool. Similarly, while editing open-filled curves with the Node Tool, you can double-click a fill to activate the Move Tool.

▼ To edit curves as you draw:

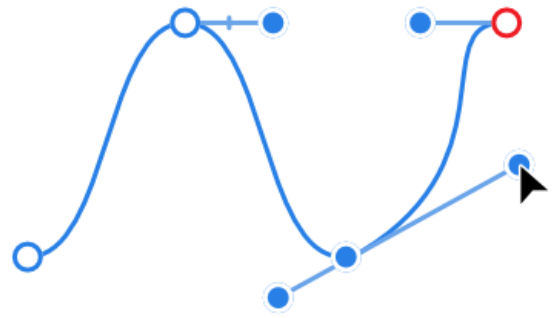
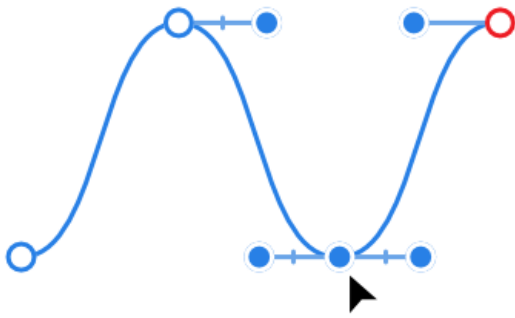
- With the **Pen Tool** active, press the **Ctrl** key to move nodes and adjust control handles when fine tuning of your curve is needed.

 With **Ctrl** key pressed, you can edit other segments in the same way by clicking them.

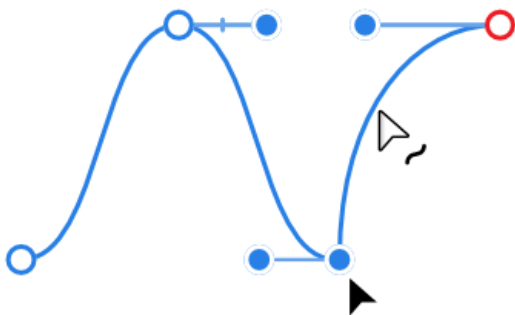
▼ To change curvature of a segment:

Do one of the following:

- Select the node and then drag the control handles.



- Drag on the line directly to pull it into position.



- **Alt**-click a segment to straighten it.
- **Ctrl**-click a segment to delete it, creating two separate curves within one curve object.



Modifier keys

When using the Node Tool, the following modifier keys can be used to speed up the workflow:

- The **Shift** key constrains node movement and control handle positioning to 45° intervals. It also extends a dragged control handle while keeping the control handle directions locked.
- The **Alt** key changes the node type to a sharp node to create a cusp in the line.
- Pressing left- and right-mouse buttons keeps both control handles locked in position while moving the node.

When using the Move Tool, Pen Tool or Node Tool, the following keys can be used to speed up the workflow:

- To decrease or increase stroke width by percentage, use the [or] keys, respectively. For smaller absolute increments instead, use an additional **Shift** key modifier.



The Node Tool can be used in conjunction with the **Transform** panel to reposition individual nodes; you can also reposition, scale or rotate multiple selected nodes relatively and precisely.

▼ To add nodes:

- With the curve selected, click at the point where you want the node to be added.

▼ To split curves with a new node:

Do one of the following:

- **Right-click** the node before the adjoining curve segment you want to add a midpoint node to and select **Split Curve After Node**.
-  Select a node, then click the same option on the context toolbar.

Which segment is split depends on the current curve orientation (indicated by a red-line indicator). Use **Reverse Curve** to change this curve orientation or reselect an adjacent node to split from.

▼ To delete nodes:

Do one of the following:

- To *retain the curve's original geometry* after deletion: with the **Node Tool** active, select the node and press the **Backspace** key or right-click the node and choose **Delete Node** from the pop-up menu. This doesn't affect the remaining curve's nodes and control handle positions.
- For a *'best-fitting' reshaped curve* after deletion: with the **Node Tool** active, right-click the node and choose **Fit To Curve Delete Node** from the pop-up menu. This is useful if you want to retain the smoothness of a stabilized curve, perhaps drawn with the **Pencil Tool**.

▼ To close curves:

Do one of the following:

- With the **Node Tool** active, right-click the end node and select **Close Curve**.
-  With the **Node Tool** active, select the curve and click **Close Curve** on the context toolbar.
- With the **Node Tool** active, drag the end node and drop on top of start node when the pointer changes.
- With the **Pen Tool** active, hold down the **Ctrl** key, right-click the end node and select **Close Curve**.

▼ To break curves:

Do one of the following:

- With the **Node Tool** active, right-click the node at the point at which you want the curve to break and select **Break Curve**.
-  With the **Node Tool** active, select a curve and one of its nodes, then click **Break Curve** on the context toolbar.
- With the **Pen Tool** active, hold down the **Ctrl** key, then right-click the node and select **Break Curve**.

▼ To join curves:

1. With the **Node Tool** (hold down the **Ctrl** key if using the **Pen Tool**), hold down with the **Shift** key and select both curves.
2. Click **Join Curves** on the context toolbar.

▼ To reverse curves:

Do one of the following:

- With the **Node Tool** active, right-click any node and select **Reverse Curve**.
-  With the **Node Tool** active, select any node and then **Reverse Curve** on the context toolbar.
- With the **Pen Tool** active, hold down the **Ctrl** key, then right-click the node and select **Reverse Curve**.

The start node will be toggled from clockwise to anticlockwise. With a closed curve selected, this direction can be viewed when **Show Orientation** (on the context toolbar) is toggled on (default). With an open curve selected, the direction of the curve is swapped, ready for further drawing from the opposite end of the curve.

▼ To convert nodes to a different type:

Do one of the following:

- With the **Node Tool** active, right-click the selected node(s) and select **Convert to Sharp**, **Convert to Smooth** or **Convert to Smart**.
-  With the **Node Tool** active, select the node(s) and click an equivalent **Convert** option on the context toolbar.
- With the **Pen Tool** active, hold down the **Ctrl** key, right-click the selected node(s) and select **Convert to Sharp**, **Convert to Smooth** or **Convert to Smart**.
- Hold the **Alt** key and click on the node to convert it to a **Sharp** node.

▼ To copy control handle length/direction from another curve's node:

- Drag a node from one curve directly over another on a second selected curve until the cursor changes to two overlapping squares, then wait until the node's handles adjust to their new positions.

▼ To change a curve or shape's stroke width:

Do one of the following:

- On the **Stroke** panel, adjust the **Width** via slider or input absolute values, expressions and formulas (percentages).
- Use the [or] keys (decrease or increase width, respectively).

▼ To fill holes in a shape:

1. From the **Layer** menu, select **Geometry>Fill Holes**.

▼ To remove inner curves within an open curve (or closed curve):

1. From the **Layer** menu, select **Geometry>Remove Inner Curves**. **Layer>Fill Mode>Winding (Non-Zero)** must be enabled.

This operates on a per layer basis.

SEE ALSO:

[Draw curves and shapes](#)

[Draw and edit shapes](#)

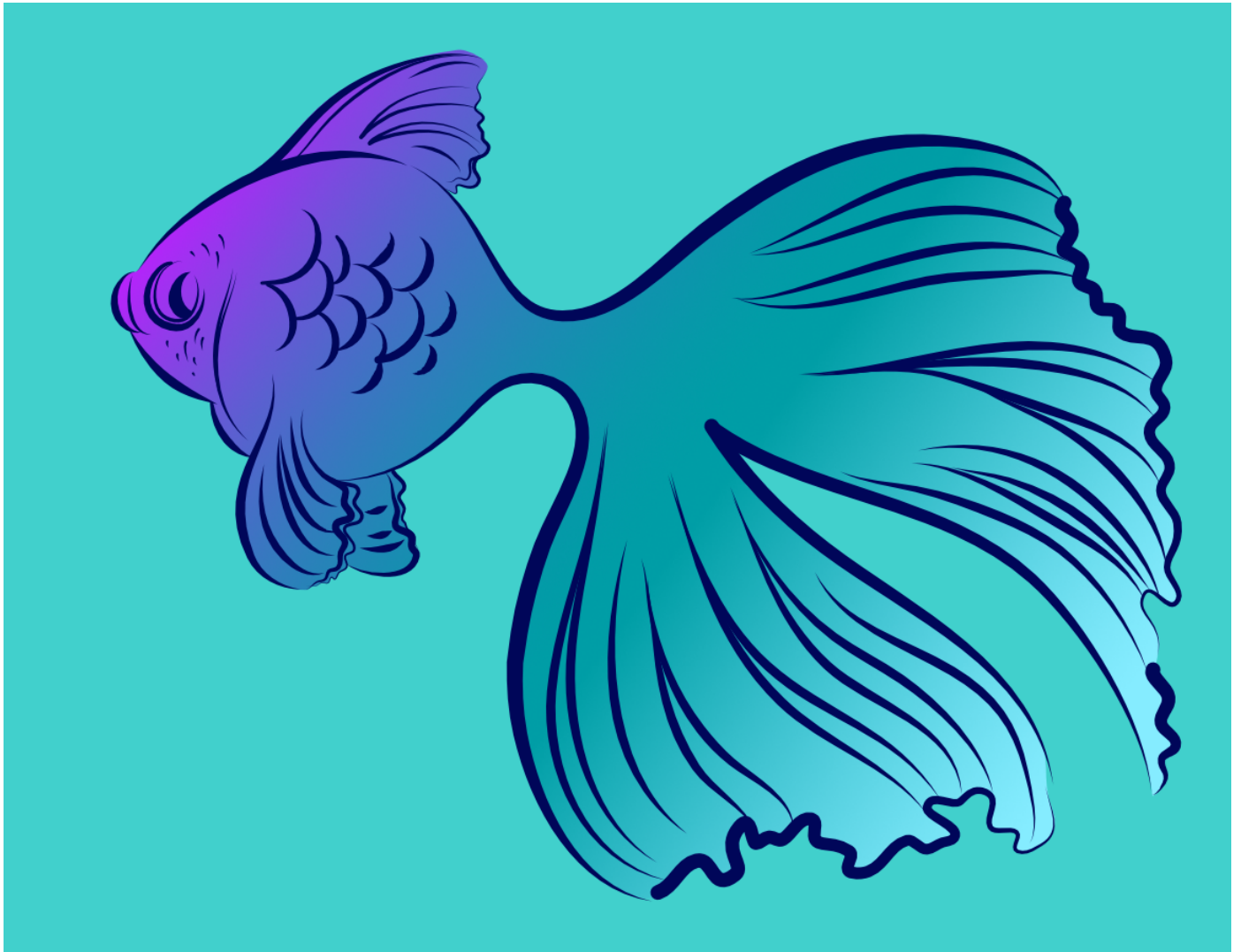
[Node Tool](#)

[Expressions for field input](#)

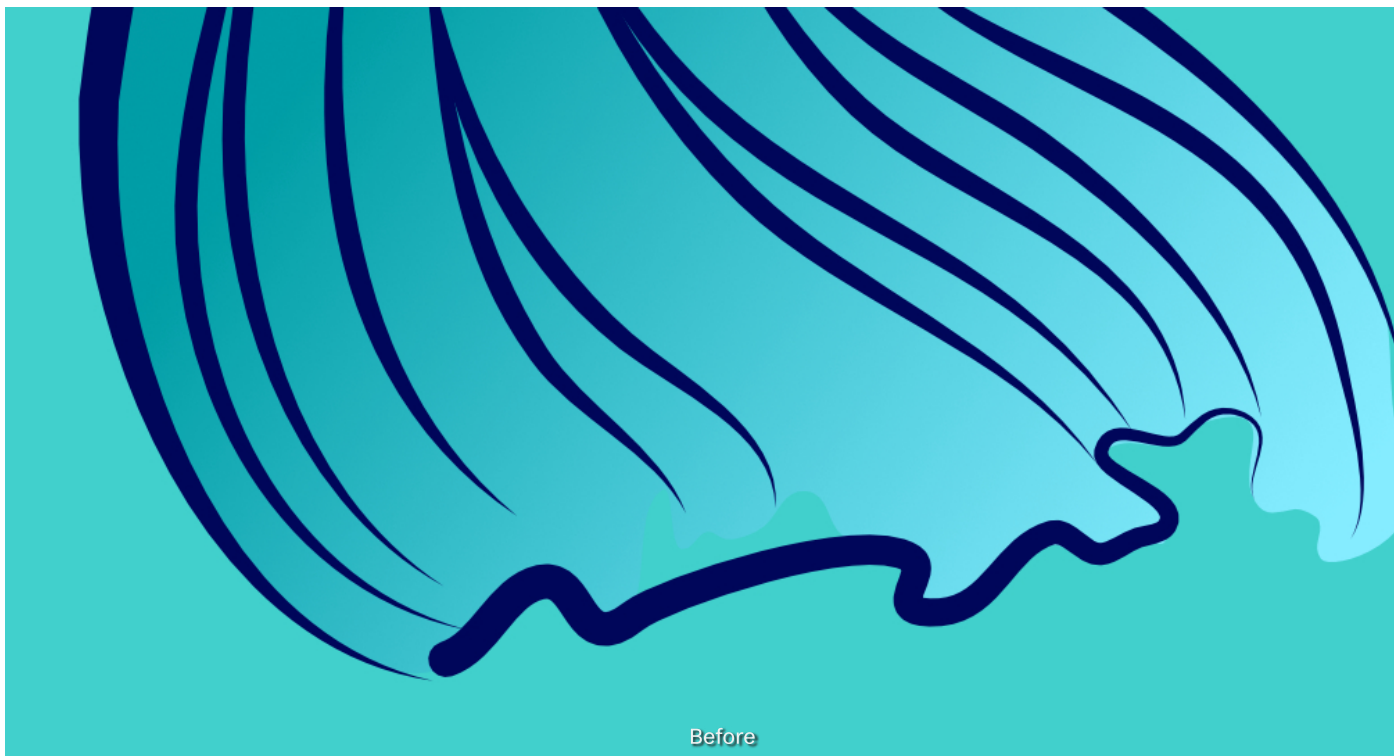
[Keyboard shortcuts for curve drawing operations](#)

Draw pencil lines

Use the **Pencil Tool** to apply pencil lines, giving a hand-drawn effect to your design. A range of settings can be enabled to fine-tune the pencil stroke's appearance.



Sculpting



Redefining and continuing a pencil stroke using Sculpt mode.

Sculpting allows you to modify the pencil stroke when the stroke is still being drawn or if it is reselected again for further editing. Two techniques are possible:

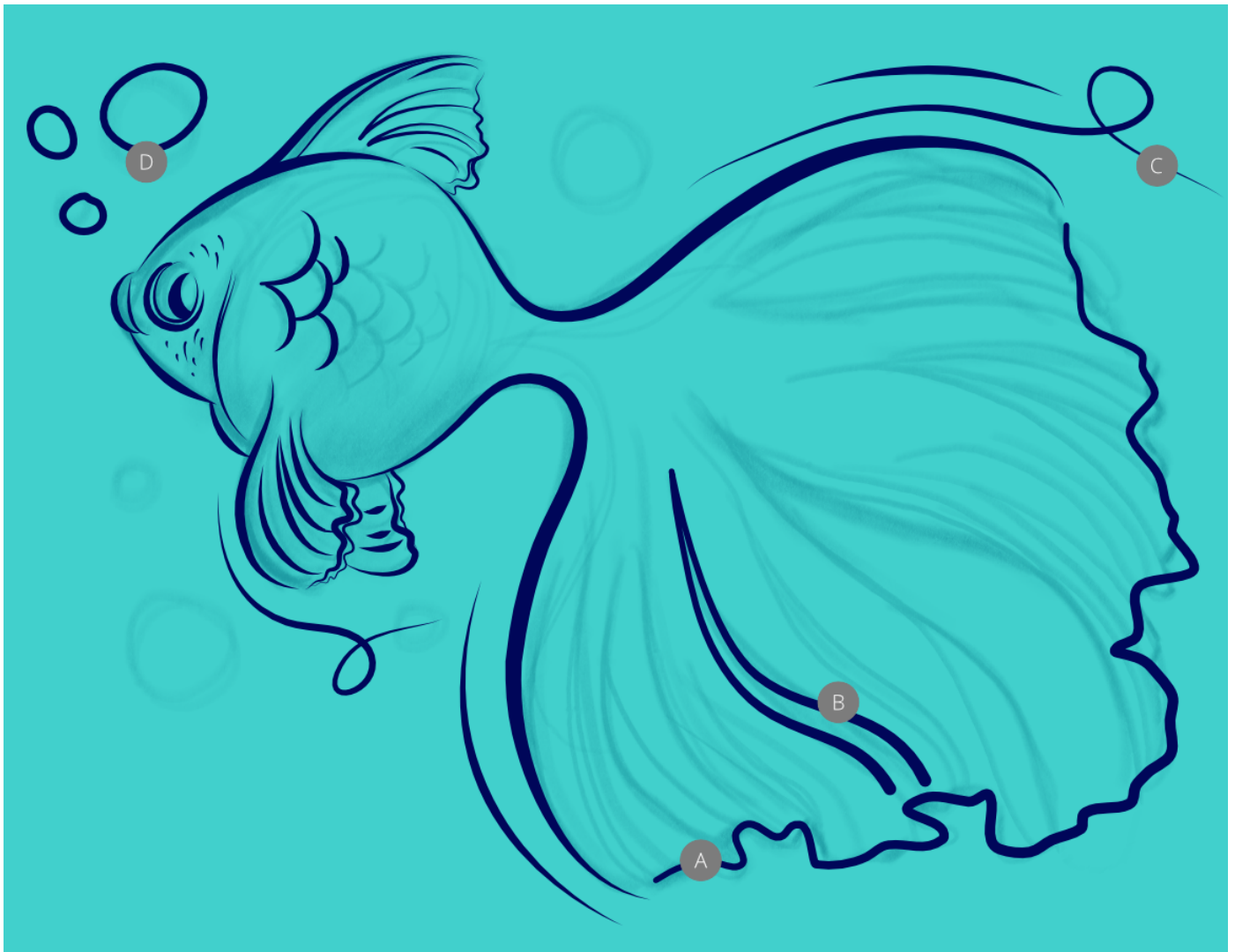
- Redraw between any two points along the stroke to redefine its path.
- Continue the pencil stroke by drawing from either end node. An Add (+) cursor appears when hovering over an end node to help guide you.

You can also perform advanced editing of the pencil stroke with the **Node Tool**. For example, node and control handles can be repositioned.

Stroke stabilization

Affinity Designer's stroke stabilizer smooths pencil lines as you draw, helping you to produce a more aesthetically pleasing stroke.

A **Rope** stabilizer or **Window** stabilizer mode can be used; the former drags the stroke end by a 'rope' to smooth the stroke, but lets you introduce sharp corners at increasing rope **Length** (radius) values by redirecting the slackened rope; the latter will smooth the stroke by averaging sampled input positions within a **Window** whose size is configurable.



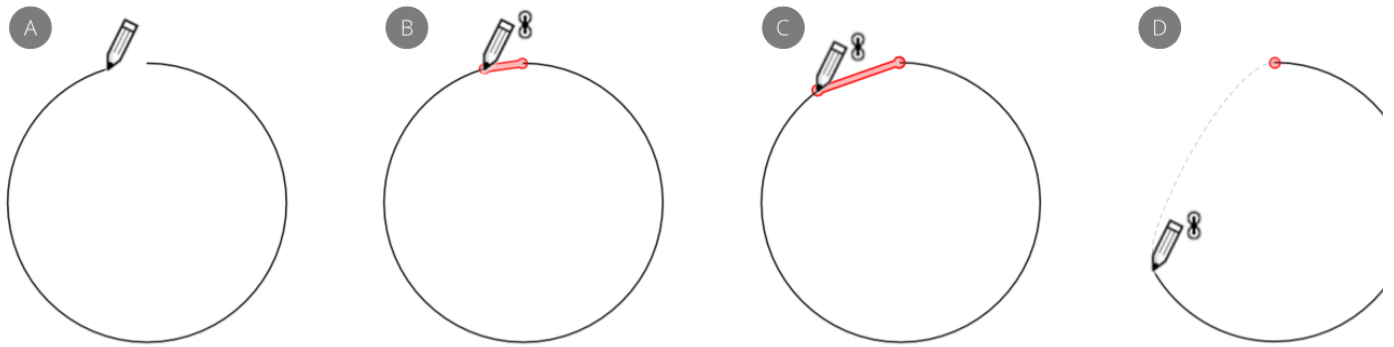
(A) Pencil line without stabilization, (B) with Rope mode stabilization, (C) with Window mode stabilization and (D) auto-closed pencil line.

Auto closing

The context toolbar's **Auto close** options let you create a closed curve from your stroke when enabled. While drawing, if the pencil cursor nears the same curve's starting node, a 'dog bone' visual aid temporarily appears to indicate that closure will occur on mouse release.

Auto close can be set with the following options on the context toolbar:

- **Off**—when enabled, you can continue applying strokes without closing the curve when the cursor approaches close to the same curve's start node; opposite to the "Close always" option.
- **Near**—when enabled, you can close the curve when the cursor approaches close to the curve's start node.
- **Far**—when enabled, you can close the curve when the cursor's position is further from the curve's start node.
- **Always**—when enabled, the curve is always closed, irrespective of the distance between the end points.



Pencil Tool drawing with Auto close options set to: Off (A), Near (B), Far (C), Always (D).

▼ To draw freehand pencil lines:

1. Select the **Pencil Tool**.
2. (Optional) On the context toolbar, do one (or more) of the following:
 - Enable **Sculpt** to reform or continue a previous pencil stroke.
 - Select one from the **Auto close** options, as required.
 - Define the strokes **Smoothness**.
 - Enable a **Controller** to have the stroke respond automatically to a pen tablet's **Pressure** input or speed of mouse movement (**Velocity**), or manually to the **Stroke** panel's Pressure profile chart (**None**).
 - Enable a **Stabilizer** option to smooth the stroke using different smoothing modes (Rope or Window).
 - Enable **Use line style** to edit the outer line of the shape drawn via the **Stroke** panel, or **Use fill** to automatically fill the concave area created by the curve with the current fill color.
3. Drag on the page in the direction that you want the path to follow.

 You can pick up color as you design by using the **Alt** key and dragging.

Modifier keys

When using the Pencil Tool, the following modifier keys can be used to speed up the workflow as you draw:

- To decrease or increase stroke width by percentage, use the [or] keys, respectively. For smaller absolute increments instead, use an additional **Shift** key modifier.
- Drawing with the right-mouse button pressed creates a straight pencil stroke. Click to start your initial stroke with the key pressed, then click at the position where your stroke is to end.
- The **Shift** key constrains a straight pencil stroke to 45° intervals, including to horizontal and vertical.
- The **Ctrl** key temporarily activates the **Node Tool**.
- To reposition the stroke on the page, press the **Spacebar** as you draw.

SEE ALSO:

[Edit curves and shapes](#)

[Pencil Tool](#)

[Node Tool](#)

[Pressure sensitivity](#)

[Stroke panel](#)

Pressure sensitivity

Affinity desktop apps offer complete flexibility when using pen tablets for real pressure-sensitive drawing and painting. If you prefer a mouse, Affinity apps offers simulated pressure sensitivity.

Whether you're using vector-based Pen, Pencil or brush tools, or pixel-based brush or retouch tools, you can simply connect your device and you're ready to go.

For mouse users, Affinity apps let your mouse become velocity sensitive by default. The same tools can be used but with simulated pressure sensitivity based on the speed (velocity) of your mouse movements.

While you get the response you need from either input, you'll still be able to fine-tune settings for pressure/velocity.

If you want to create a custom pressure profile that can be applied to a previously drawn stroke, you can design it and apply it from the Stroke panel. This can be optionally saved as is, or modified before saving.

Pressure sensitivity while painting

Pressure-sensitive painting is governed by the brush controller which is set to automatic by default—it senses the type of input device and varies brush size, flow, etc. as you paint according to a particular input:

- For Vector Brush Tool: 'Automatic', 'Pressure', 'Velocity', 'Brush Defaults', or 'None'. Automatic will sense the type of input automatically for you.
- For pixel brushes: 'Pressure', 'Tilt', 'Velocity', 'Velocity Inverse', 'Random', 'Angle', 'Cyclic', 'Direction', 'None'.

If set to 'None', the brush is always a fixed size, flow setting, etc. Otherwise, the brush stroke properties will vary from a minimum to maximum amount (e.g. the full brush width).

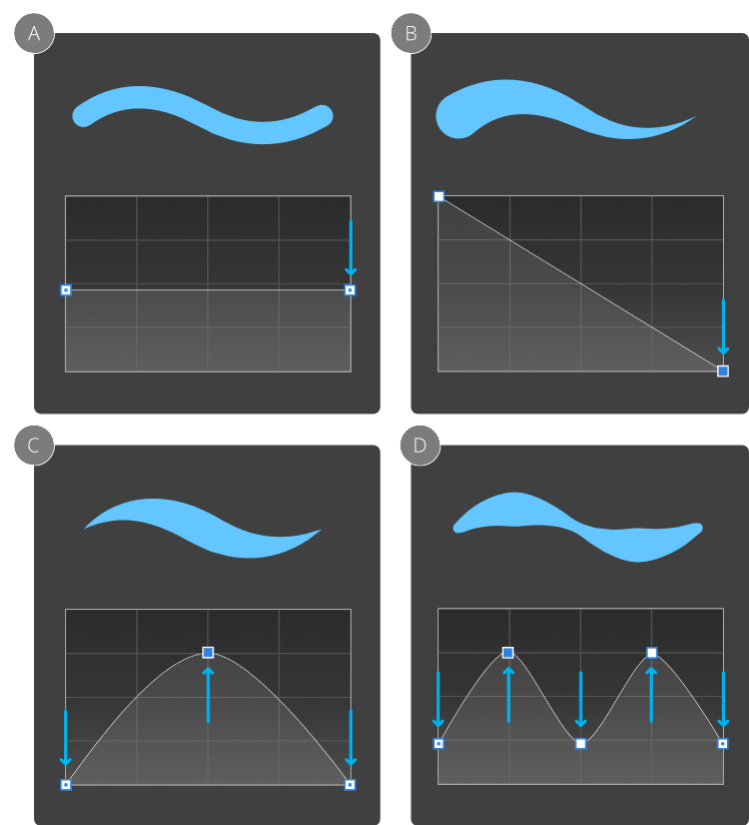
Jitter options

- For vector brush settings: jitter options let you control how brush size and flow are affected by your pressure-sensitive device or mouse.

- Pixel brush settings: as for vector brush options, but additional jitter options are provided that affect brush hardness, shape, color, and the scatter and rotation of nozzles.

▼ To create a custom pressure profile:

1. On the **Stroke** panel, click the **Pressure** input box.
2. Manipulate the chart by moving the square *pressure points* to form the desired pressure profile.
(See examples below.)
3. Begin drawing your strokes.



Uniformly reducing stroke width using locked points (A), linear tapering of stroke (B; unlocked by **Alt**-drag or second click then drag), tapering of stroke at both ends (C; a combination of A and adding a new point by clicking) and modulating stroke width (D; a combination of A and adding multiple points).

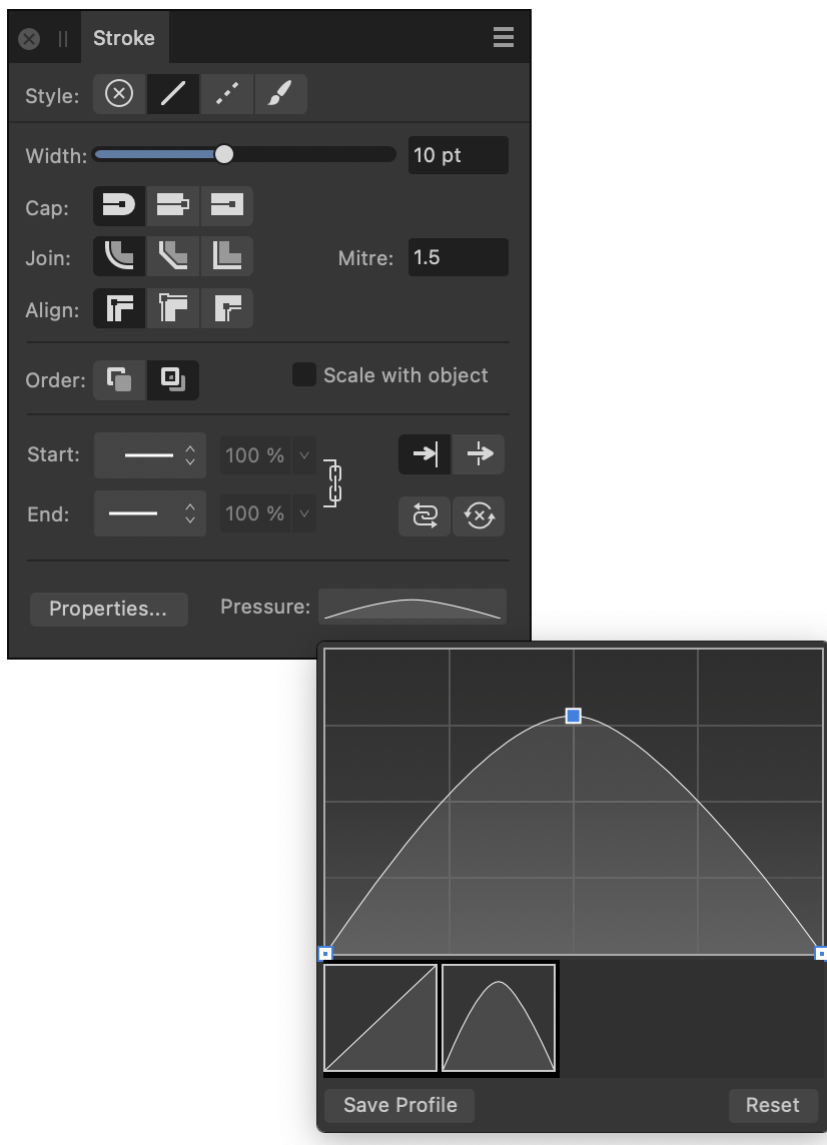
Point type	Description
	End point (deselected)—drag to move <i>both</i> end points up/down at the same time
	End point (selected)—drag to move <i>both</i> end points up or down at the same time or click to move the end point independently of the other end point
	Added point (deselected)— drag to reposition the point which becomes selected
	Added point (selected)—drag to reposition the already selected point

▼ To save a pressure profile:

- Under the chart, click **Save Profile**. The profile shows under the chart.

▼ To apply a custom pressure profile to a selected stroke:

1. From the **Stroke** panel, click the **Pressure** option.
2. Select a custom profile from below the chart. The chart will update, showing the chosen profile.



▼ To reset the pressure profile:

- Select **Reset** below the chart.

The profile reverts to its default.

 Click on any point to select it. Any added points can be deleted by pressing the **Delete** key.

Edit on-page pressure profiles

The **Stroke Width Tool** lets you edit the pressure profile of curves created with line tools, typically the Pencil Tool, but also the Pen Tool and Vector Brush Tool.

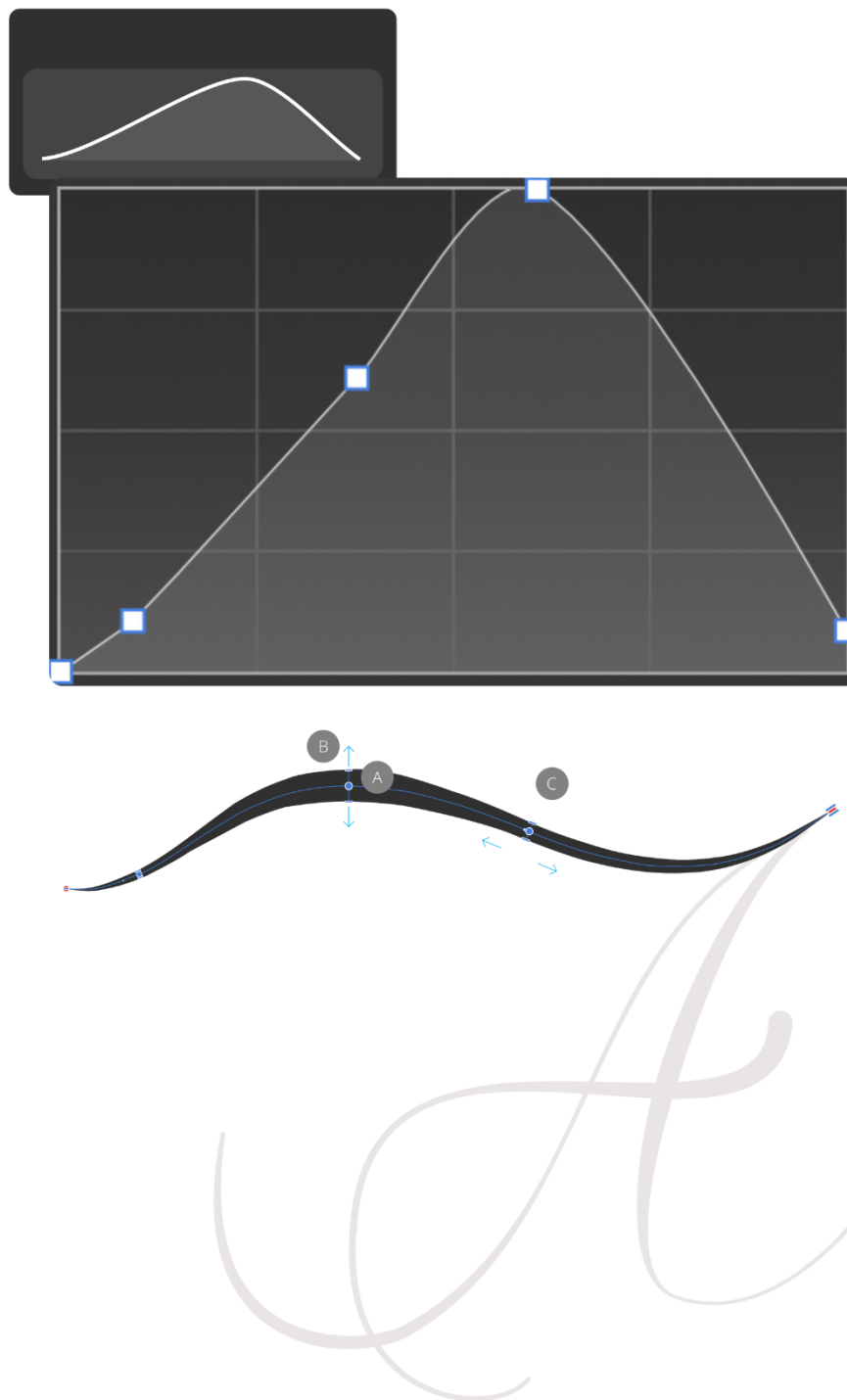
About editing pressure profiles

The stroke width at any position along a drawn stroke can be adjusted by creating placed *pressure points*. At these points you can adjust stroke widths symmetrically using point handles to form a custom pressure profile that runs the length of the curve.

The benefits include:

- Precise editing control of the pressure profile
- Designing of the stroke's profile is more in context with other elements on the page
- Better visibility of the pressure profile for longer stroke lengths compared to the profile shown in the Stroke panel's Pressure chart

The pressure profile is traditionally represented on the Stroke panel's Pressure chart. The points on the chart are the same pressure points you add by clicking on the curve with the **Stroke Width Tool** active. Conversely, if you add a point to the Pressure chart, it will appear on the curve in a position relative to that on the chart.



Correlation between the Stroke Panel's Pressure chart and the equivalent on-page pressure profile. The stroke width at a pressure point (A) can be increased or decreased by dragging point handles (B) while any pressure point can be repositioned by dragging (C).

Snapping while profile editing

The tool's context toolbar hosts several snapping controls that snap pressure points onto existing nodes or existing stroke widths on the curve.

Profile editing and painting

Vector brush strokes can have their pressure profile edited just like with strokes created with the Pencil and Pen tools. It's important to understand that vector brush strokes have **Size Variance** and **Opacity Variance** settings that control how much the stroke size and opacity responds to pressure. If you edit the pressure profile with the Stroke Width Tool you may see size and/or opacity changing because of these settings.

**To create a pressure point:**

1. Select the **Stroke Width Tool**.
2. Click on a position on the curve.

The point's handles extend symmetrically outwards from the 'on-curve' point to the current stroke width.

▼ To adjust the stroke width at a pressure point:

Do one of the following:

- Drag either point handle.
- For a precise width, **Ctrl**-click on the point and set a value in the **Set Stroke Width at Point** dialog.

▼ To adjust the pressure point width and position:

- Drag the point to anywhere along the curve.

▼ To lock a pressure point's position but adjust the stroke width:

- With the **Shift** key held, drag the point's handle inwards or outwards.

▼ To lock a pressure point's width and adjust its position:

- With the **⌘** key held, drag the point to anywhere along the curve.

▼ To unlink stroke widths on a closed curve's start/end point:

- **Shift**-drag out from the pressure point.



To adjust the width on the opposite end of the closed curve, swap the curve direction using **Reverse Curves** on the Node Tool's context toolbar before adjustment.

▼ To set equal stroke widths on a closed curve's start/end point:

- Double-click on either point handle to link the stroke widths. This sets the smaller stroke width to be equal to the larger stroke width.

▼ To delete a pressure point:

- Double-click on a point (or its handle).

▼ To save a pressure profile:

- On the **Stroke** panel, click **Pressure**.
- Under the chart, click **Save Profile**. The profile shows under the chart.

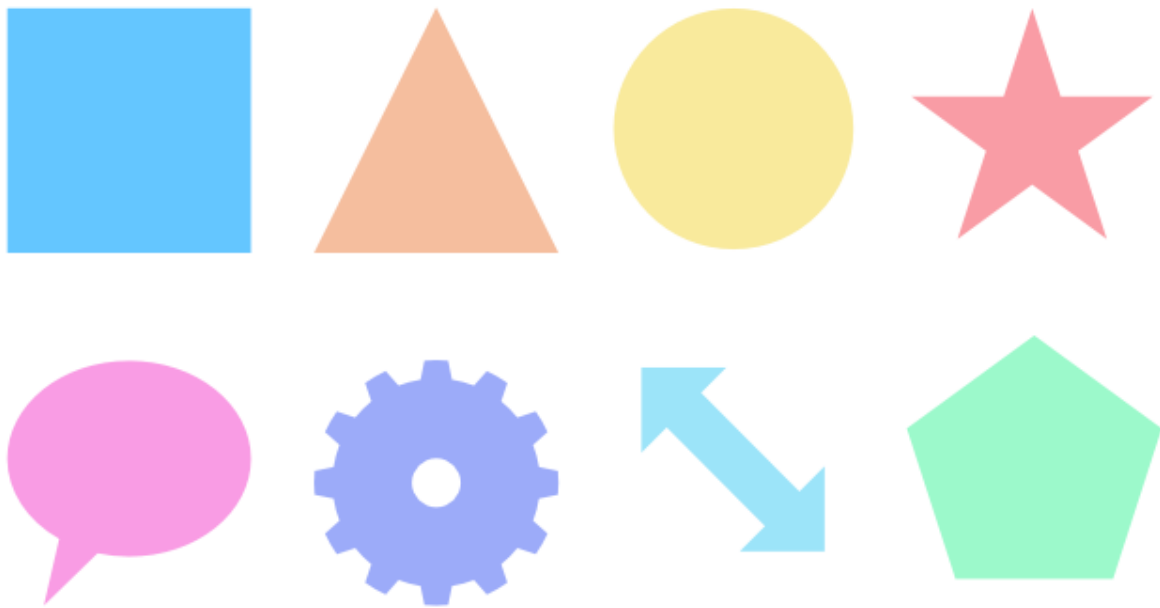
**Modifier keys**

When using the Stroke Width Tool, the following modifier keys can be used to speed up the workflow as you draw:

- When held, the **Shift** key locks the pressure point's position allowing just stroke width adjustment.
- Double-click a start/end point on a closed curve to set equal stroke widths; use **Shift**-drag to unlink.
- Press the **Ctrl** key and click on a pressure point to set a precise stroke width via dialog.

About geometric shapes

Most geometric shapes, such as squares, circles and polygons, are difficult to draw accurately freehand. We've provided a selection of useful shapes to help you solve this problem. The shapes are fully geometrically correct, customizable, and can even be [converted to curves](#) for additional editing.



Shapes are easy to modify by changing the properties on the context toolbar or by dragging the special red handles. When hovered over, the direction in which they can be dragged is indicated by the pointer and/or a horizontal line.

▼ Available shapes:

- [Rectangle](#)
- [Ellipse](#)
- [Rounded Rectangle](#)
- [Triangle](#)
- [Diamond](#)
- [Trapezoid](#)
- [Polygon](#)

- [Star](#)
 - [Double Star](#)
 - [Square Star](#)
 - [Arrow](#)
 - [Donut](#)
 - [Pie](#)
 - [Segment](#)
 - [Crescent](#)
 - [Cog](#)
 - [Cloud](#)
 - [Callout Rounded Rectangle](#)
 - [Callout Ellipse](#)
 - [Tear](#)
 - [Heart](#)
 - [Spiral](#)
-

SEE ALSO:

[Draw and edit shapes](#)

[Converting objects to curves](#)

[Snapping](#)

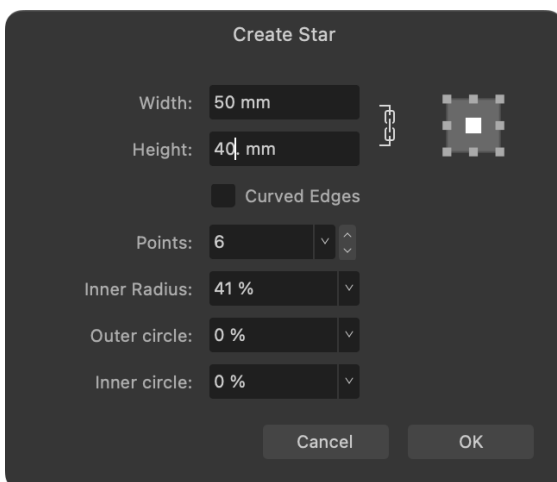
Draw and edit geometric shapes

Geometric and other special shapes that would be otherwise hard to draw can be easily created using one of the corresponding shape tools. Once drawn, both the shape and its stroke can be made into curves for more freeform design.



▼ To draw a new shape:

1. Choose one of the shape tools, e.g., **Rounded Rectangle** from the Tools panel.
2. Do one of the following:
 - For precise *Object data entry*: **Ctrl**-click on the page, then enter your shape dimensions and properties into the dialog (use the **Tab** key and up/down keyboard keys to jump between and increment values, respectively).



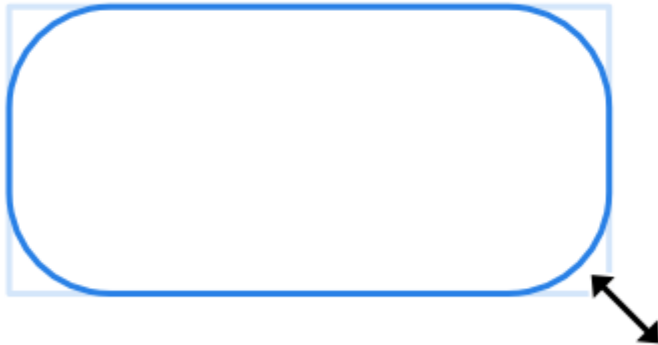
To add the same shape again, double-click on the page while the **Ctrl** key is still pressed.

On the page/pasteboard, shapes will always be centered under the current cursor position, but can be positioned in relation to a repositioned anchor point on the dialog.

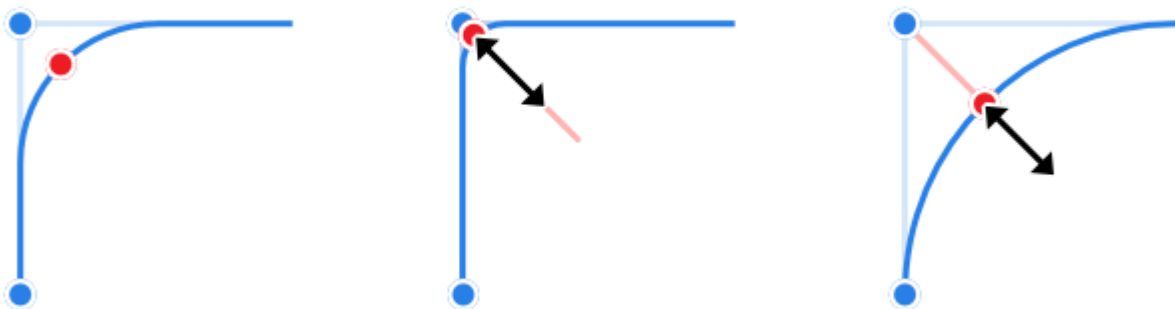
With **Snapping** enabled, shapes can also be created and centered on a shape's bounding box (including corner handles) by **Ctrl**-clicking.

To cancel the operation, press the **Esc** key (settings will be remembered).

- For sizing 'by eye': Drag on the page, using the **Shift** key to constrain the shape's proportions if needed.



With either method, modify options as required, either by changing the values on the context toolbar or by dragging the red handle(s) (if available).



💡 When you hover over a handle, a red guide line will appear to suggest the direction of drag needed to modify your shape.

💡 Shapes can be converted to text frames via **Layer>Convert to Text Frame**.

 Every subsequent shape of the same type you create will assume previously used settings.

▼ To reset a shape handle to its initial position:

- Double-click the red handle that has been previously moved. Any other repositioned handles on the shape will not be affected.

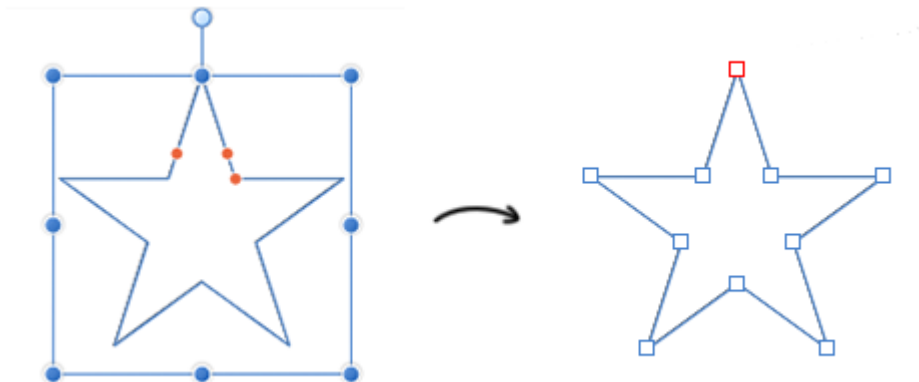
▼ To edit an existing shape:

1. Click the **Node Tool**.
2. Select the shape, either by clicking the shape or by clicking the layer entry in the **Layers** panel.
3. Edit the shape as required by either by directly dragging the red handle(s), or by changing the values on the context toolbar.

 Shapes have special snapping properties which allow lines to snap to various angles within the shape.

▼ To convert a shape to curves:

- Click **Convert to Curves**, found in either the **Layer** menu or on the context toolbar.



The shape is now made from curves. Segments and nodes can be modified with the **Node Tool**.

 Applying a rounded corner to a geometric shape using the **Corner Tool** will automatically convert that shape to curves. From that point, you won't be able to make use of the shape tool's inherent 'morphing' behavior.

Modifier keys

As you create shapes, the following modifier keys can be used while the shape is being drawn:

- The **Shift** key constrains shape's proportions at the time of creation.
- The **Ctrl** key draws or resizes from center (can be combined with the **Shift** key).
- Where appropriate, on many shapes, the **Ctrl** key moves the red handles in pairs.
- Pressing the right mouse button lets you rotate a shape about its opposite handle.
- The **Spacebar** lets you reposition a shape at the time of creation.
- You can pick up color as you design by using the **Alt** key and dragging.

Presets

Presets can be applied to shape tools from the context toolbar. These allow you to take variations of standard shapes and reuse them instantly. A number of master presets have been supplied, but you can also create and define your own presets using the **Preset Manager**.

▼ To apply tool presets:

1. Select the shape you wish to access presets for.
2. From the shape's context toolbar, click the **Presets** icon.
3. A pop-up panel containing a list of available presets for the shape will be displayed. By clicking on a preset, you can apply it to the selected shape.
4. Where applicable, select a different category from the menu at the top of the panel to switch preset categories.

 Master presets which have been supplied by Affinity will have an Affinity logo in the bottom right hand corner; user defined or custom presets will have a user logo in this corner instead.

▼ To create new custom tool presets:

1. Select the shape you wish to create a new preset for and edit it to your liking.
2. From the shape's context toolbar, click the **Presets** icon.
3. From the pop up panel, select **Create Preset** from the preferences menu. Enter a name and category for your new preset, then click **Create**.

▼ To manage tool presets:

1. Select the shape you wish to access presets for.
 2. From the shape's context toolbar, click the **Presets** icon.
 3. A pop up panel containing a list of available presets for the shape will be displayed. From this panel, select **Manage Presets** from the preferences menu.
 4. The **Preset Manager** will be displayed. From here, you can do the following:
 - Drag and drop preset thumbnails into an existing category to move them into that category.
 - Right-click on a preset to rename it, delete it, export it, or revert any changes you have made to it.
 - Click on a category menu to rename it, delete it, restore master presets to it, import user presets directly to it, or export presets from it.
 - To create a new preset category, select **Create Category** and enter a name for your new category.
 - To return all master presets to their original uncategorized state, select **Restore Master Presets**.
 - To export any user defined presets from the **Preset Manager**, select **Export User Presets**. Type a name for the exported file along with any tags you would like it to have, choose the disk location you want to save it to and click **Export** or **Save**.
 - To import presets to the **Preset Manager**, select **Import Presets**. Locate the .aftoolpresets file you want to import and click **Import**.
 - To view presets for a different shape, select the shape from the **Filter:** menu.
-

SEE ALSO:

[About geometric shapes](#)

[About lines, curves and shapes](#)

[Edit curves and shapes](#)

[Frame text](#)

[Keyboard shortcuts for curve drawing operations](#)

Draw QR codes

Affinity allows you to draw a square shape in which it will generate a QR code using data you specify via the context toolbar.



An example QR code that links to a website.

When setting a QR code's data, you can select from several common data types. Available settings depend on the selected type.

- **Text**—for encoding any text you wish, especially if it doesn't fall into one of the other types.
- **URL**—for visiting a resource, usually online, such as a web page, a downloadable file, or an FTP site.
- **Phone**—for making an audio call to a suitable telephone number.
- **SMS**—for sending a single-line or multiline text message to a telephone number.
- **Email**—for sending a message to a specified recipient, optionally with a default subject and body.
- **WhatsApp**—for sending a message to a user of Meta's instant messaging service.
- **FaceTime**—for making a video or audio call to a user of Apple's communication service.
- **Location**—for looking up a physical location using its longitude, latitude and elevation.
- **Wi-Fi**—for joining a wireless network using provided credentials, e.g. network name, encryption type and password.
- **vCard**—for sharing contact information as an electronic business card.

The Text data type can be used to encode freeform information. For example, it can be used to generate QR codes for:

- sharing calendar events as vCal (.vcal) and iCalendar (.ics) data.
- making calls with other communication services, such as Skype and Zoom.
- deep-linking to content in a mobile app using the app's custom URL scheme.

Data validation

Each data type requires you to provide one or more values.

When a value is required and empty or is otherwise invalid, Affinity displays an alert icon  next to it. Hover the pointer over the icon for an explanation of what is considered to be valid.

Some values are optional. For example, you do not need to provide a message body for an email.

When using the Text data type, you will need to validate the data manually.

QR code legibility

QR codes are constructed from small, square blocks called **modules**. Affinity automatically determines the appropriate module size based on data length and content. A QR code can consist of anything from 21 by 21 modules up to 177 by 177 modules.

QR codes are usually printed in black and white. In Affinity, the color of modules that are usually printed black can be changed using the **Fill** setting on the context toolbar.

Modules that are usually printed white are transparent. If this results in background elements of your design showing through the QR code, consider creating a rectangle behind the QR code to ensure the code can be scanned. QR codes also require a margin on all sides in which nothing is printed.

For further advice on QR code presentation, including the use of color and the code area and margin, see the [FAQ at the technology's official website](#).

▼ To create a QR code:

1. On the shape tools flyout, select the **QR Code Tool**.
2. In the document view, drag on the page to set the required size of the QR code.
3. On the context toolbar, select the **Data** setting. On the dialog that appears:
 - a. Select the **Type** of data for which to generate a QR code.
 - b. (Optional) Select **Clear** to remove any and all prepopulated information.
 - c. Set all required information to a valid value.
 - d. (Optional) Set additional information as needed.
4. Select **OK**.

The QR code automatically regenerates as you change its data.

💡 When creating a QR code for a URL, select **Visit Target URL** to the right of the URL to verify the target is correct.

✎ A QR code's data can be modified at any time by using the QR Code Tool to select the code and then clicking the Data setting on the context toolbar.

SEE ALSO:

[QR Code Tool](#)

Arrowheads

You can add arrowheads to your lines while working with the **Pen Tool**, **Pencil Tool** and shapes.



Arrowheads added to strokes.

About arrowheads

Strokes and lines can be modified in a number of ways with both arrowheads and optionally tails. Some applications of these include:

- Change the style of the arrowhead and/or tail.
- Scale the arrowhead and tail in relation to the stroke, either simultaneously or independently.
- Control the arrowhead/tail position in relation to the line end.

▼ To add arrowheads to a stroke:

1. With a line or curve selected, navigate to the **Stroke** panel or click the **Stroke properties** setting from the context toolbar.
2. Select an arrowhead style from the **Start** and/or **End** pop-up menus.
3. Choose where to position the start and end styles from **Place arrow within the line** and **Place arrow at the end of the line**.
4. With arrowhead styles selected, you can then enter a percentage to the **Start** and **End** styles to adjust the size of your selected arrowheads in proportion with the stroke width.

 To swap the Start and End points click **Swap arrowhead with tail**.

 Click **Clear arrowhead** to clear arrowhead settings if needed.

SEE ALSO:

[Pen Tool](#)

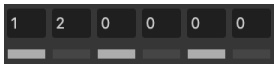
Dot/dash line styles

Dot and dash line styles can be applied to objects as strokes and further customized to create a variety of different patterns.

About dot/dash line styles

The **Stroke** panel, and **Stroke properties** (on the **Pen Tool** or shape tool's context toolbar), let you change your stroke into a dotted or dashed line. For either, the **Dash Pattern** controls appear when the Dash Line Style is set.

A section of the panel sets the line's pattern using three number pairs:



- The first two **dash** and **gap** values set the length of the initial dot/dash and subsequent space, respectively. This gives a uniform pattern. Ensure the third/fourth and fifth/sixth pairs are set to 0 (as shown above).
- The third/fourth and fifth/sixth pair values, when set, introduce a more complex pattern by setting a different size for additional dots/dashes and spaces.

To configure, you can enter values directly or drag the dash (white) or gap (black) strips under the number sequence to the left or right to adjust in 0.1 increments.



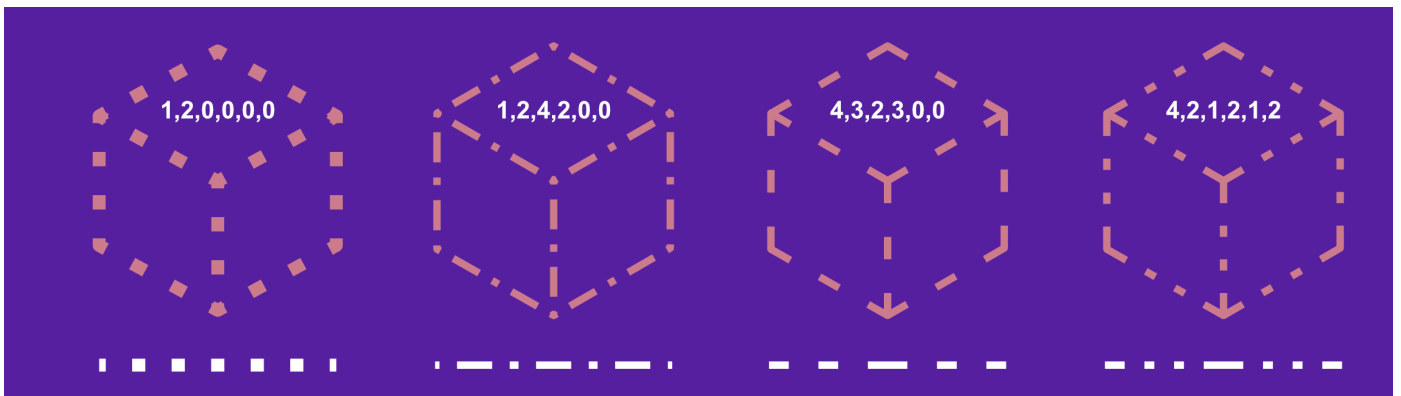
When enabled, **Balanced Dash Pattern** applies the pattern to the shape's outline so it appears seamless along the outline and is symmetrical at all corners. When **Balanced Dash Pattern** is disabled, you can set the **phase** value to manually 'shift' the dot/dash line style along so the design begins at a different point in the style's sequence.



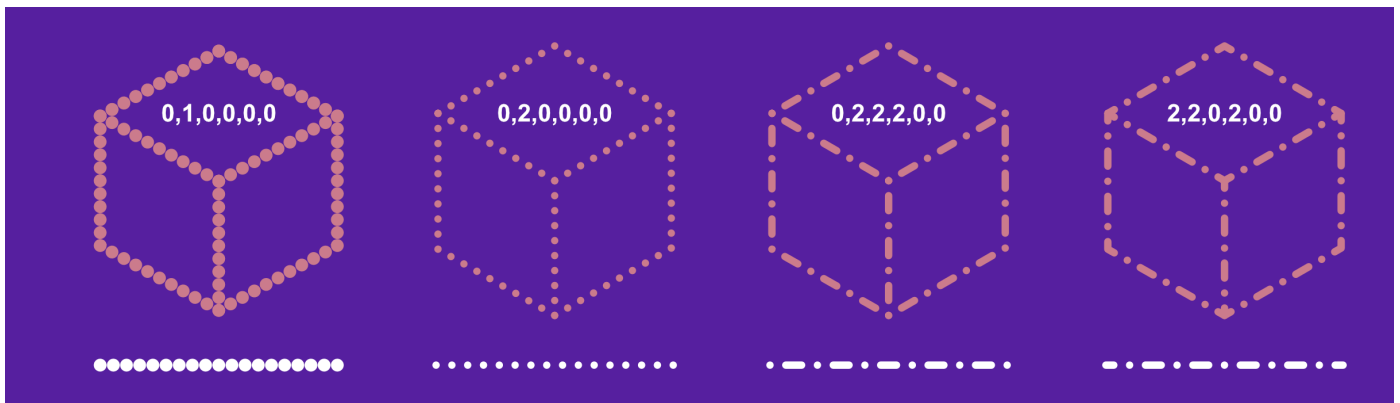
You can choose between dots or dashes by setting the **Cap** type on the **Stroke** panel or via **Stroke properties**. Use **Round Cap** for dots and rounded dashes, **Butt Cap** for squared dashes.



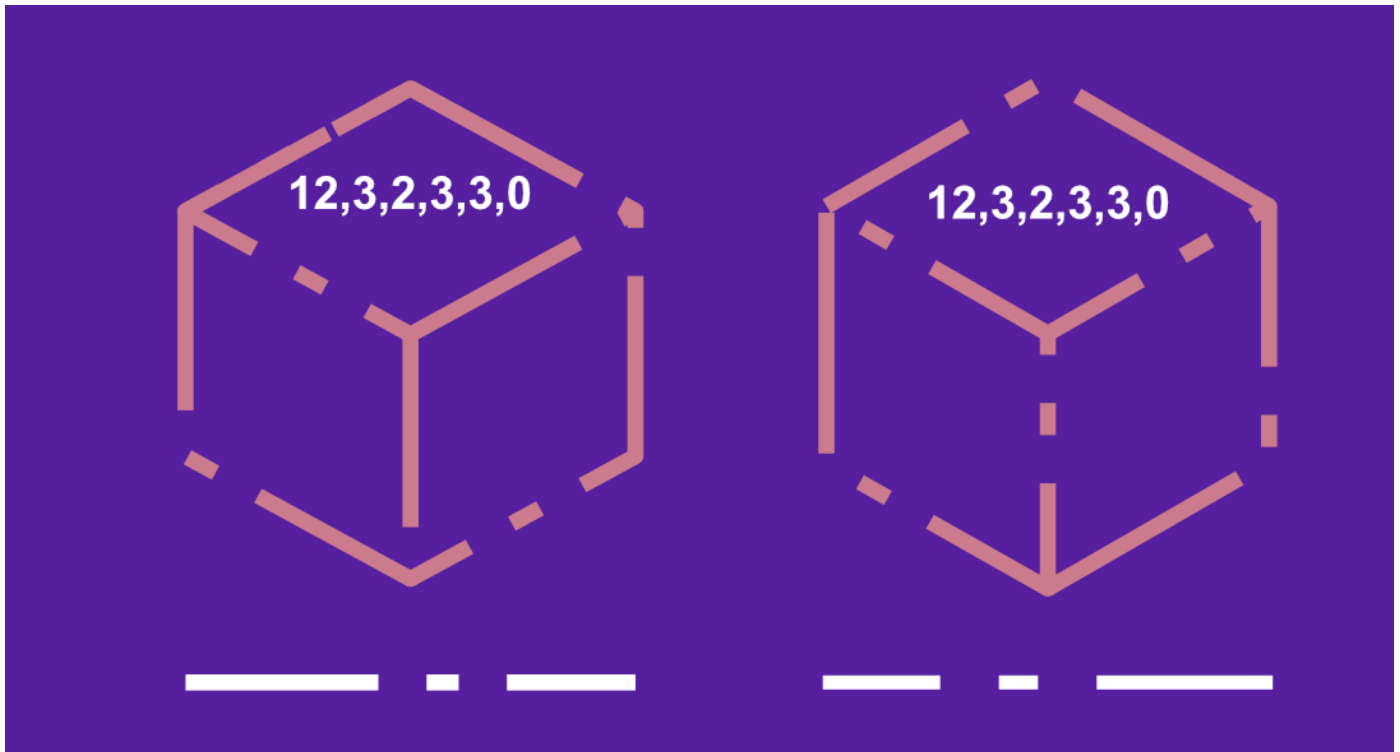
All values are based on the current line width, e.g. a value of 2 is twice the line width.



Dashed line style with **Butt Cap** and **Balanced Dash Pattern** enabled.



Dotted and dashed line style with **Round Cap** and **Balanced Dash Pattern** enabled. The value 0 shows as a dot because it is zero length and formed from a pair of round caps.



Dashed line style with **Butt Cap** enabled, **Balanced Dash Pattern** disabled and **Phase** settings **0** (left) and **2** (right), respectively.

SEE ALSO:

[Pen Tool](#)

[Node Tool](#)

[Pressure sensitivity](#)

[Keyboard shortcuts for vectors](#)

Texture line styles

You can add brush-based texture to your stroke while working with the **Pen Tool**, **Pencil Tool** and shapes.



Texture line style added to a stroke.

About Texture line style

Texture line style is based on a brush you can select from the **Brushes** panel. It can be used to add a texture-based stroke to curves and shapes.

▼ **To add a texture line style:**

1. With a line, curve or shape selected, navigate to the **Stroke** panel or click the **Stroke properties** setting from the context toolbar.
2. From the **Style** section, select **Texture Line Style**.
3. Set the desired **Width**.
4. On the **Brushes** panel, navigate to the brush you'd like the texture to be set to.
5. (Optional) Click **Properties** to modify your brush settings that affect the stroke.



You can quickly swap from a Solid or Dash Line Style to a Texture Line Style by selecting a brush from the **Brushes** panel.

SEE ALSO:

[Pen Tool](#)

[Node Tool](#)

[Pressure sensitivity](#)

[Keyboard shortcuts for vectors](#)

Using multiple strokes and fills

From the **Appearance** panel, you can add a number of separate strokes and fills to any selected object. These can be gradients or solid colors. This combined with the ability to alter the transparency and blend mode for each stroke and fill applied, can be used to produce a range of different color interactions between upper and lower strokes and fills.

Strokes and fills listed in the **Appearance** panel are arranged by z-order (like layers in a layer stack) and can be dragged and dropped to reposition them within the panel.

- 💡 By setting a decreasing stroke width on strokes higher up in the stack, you can easily create interesting decoupage effects, which work especially well with varying blend modes (for example, the erase mode).



▼ To add additional strokes or fills:

1. With an object selected, click on the **Appearance** panel.
2. From the panel, select **Add Stroke** or **Add Fill**.

▼ To edit a stroke or fill:

- Select the stroke or fill in the **Appearance** panel.

- Click on the stroke/fill color selector to alter the color or apply a gradient.
- For strokes, click on the stroke width value to alter the stroke properties.
- Click on the current blend mode to swap it for another using the pop-up menu.

▼ To make a stroke or fill active for editing:

- With an object selected, click on a stroke or fill from within the **Appearance** panel.

 When a fill or stroke is made active, this will be denoted by a white dot to the left of that stroke/fill in the **Appearance** panel. This fill or stroke can then be edited directly via the **Color** and/or **Stroke** panels. Strokes and fills can also be saved as styles within the **Styles** panel.

▼ To reorder strokes and fills:

- Drag and drop strokes and fills within the **Appearance** panel.

 The **Stroke** panel's **Order** button can also be used to place the active stroke either in front of or behind the object's fill(s).

SEE ALSO:

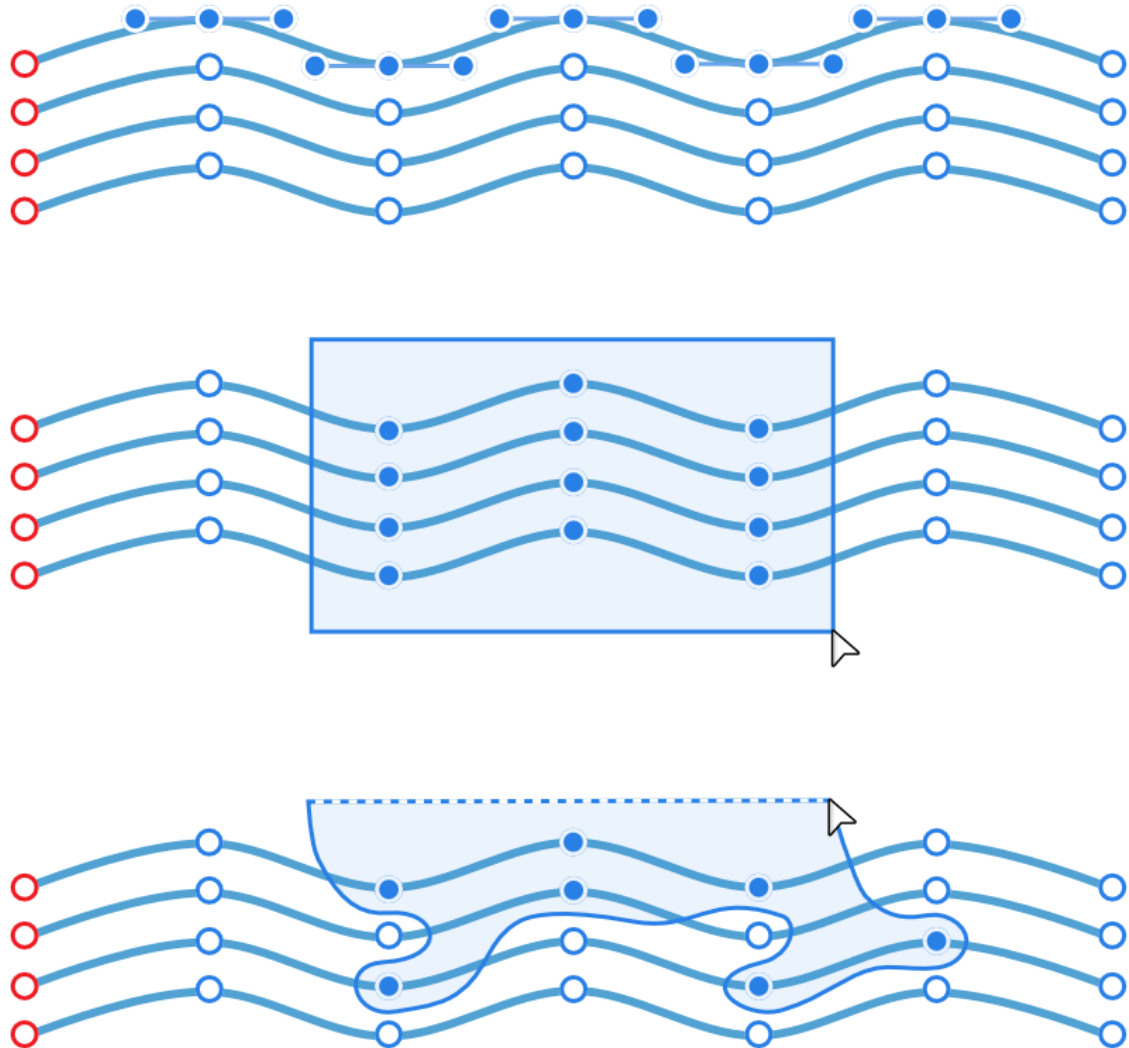
[Appearance panel](#)

[Stroke panel](#)

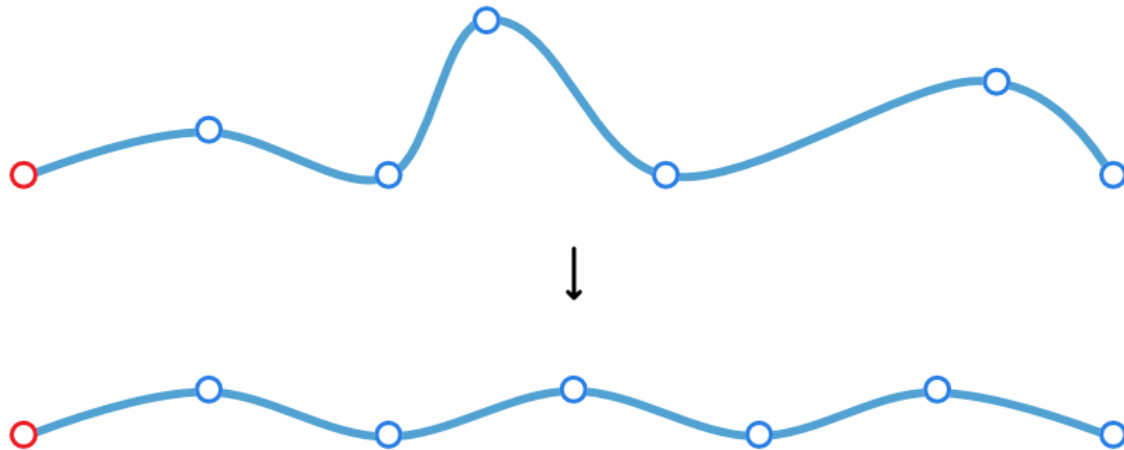
[Styles panel](#)

Selecting and aligning nodes

When editing curves or shapes you can select multiple nodes in different ways. With selection control, you can then align and distribute nodes as you would with multiple selected objects, as well as [transform](#) selected nodes.



Selecting node-by-node, by marquee and by lasso.



Aligning and distributing selected nodes.

 Use the [and] keys to jump forwards and backwards through nodes on a curve.

▼ To select multiple nodes:

- With the **Node Tool** and curve/shape selected, do one of the following:
 - Node-by-node selection: With the **Shift** key pressed, click individual nodes in turn.
 - Marquee selection: Drag a marquee selection area over nodes to include them in your selection.
 - Lasso selection: With the **Alt** key pressed, either:
 - Draw freehand around nodes to encompass them in the blue selection area.
 - Draw a polygonal area around nodes taking a click-by-click approach.

 To deselect a node from a multiple selection, click it while the **Shift** key is pressed.

▼ To align/distribute multiple nodes:

1. With the **Node Tool** and curve/shape selected, select one or more nodes on the curve or shape as above.
2. On the Toolbar, click **Alignment**, set the **Align To** option, then an **Align Horizontally** or **Align Vertically** option from the pop-up panel. To distribute, choose a **Space Horizontally** or **Space Vertically** option from the pop-up panel.

Vertically option from the end of the icon row.

3. Click **Apply**.

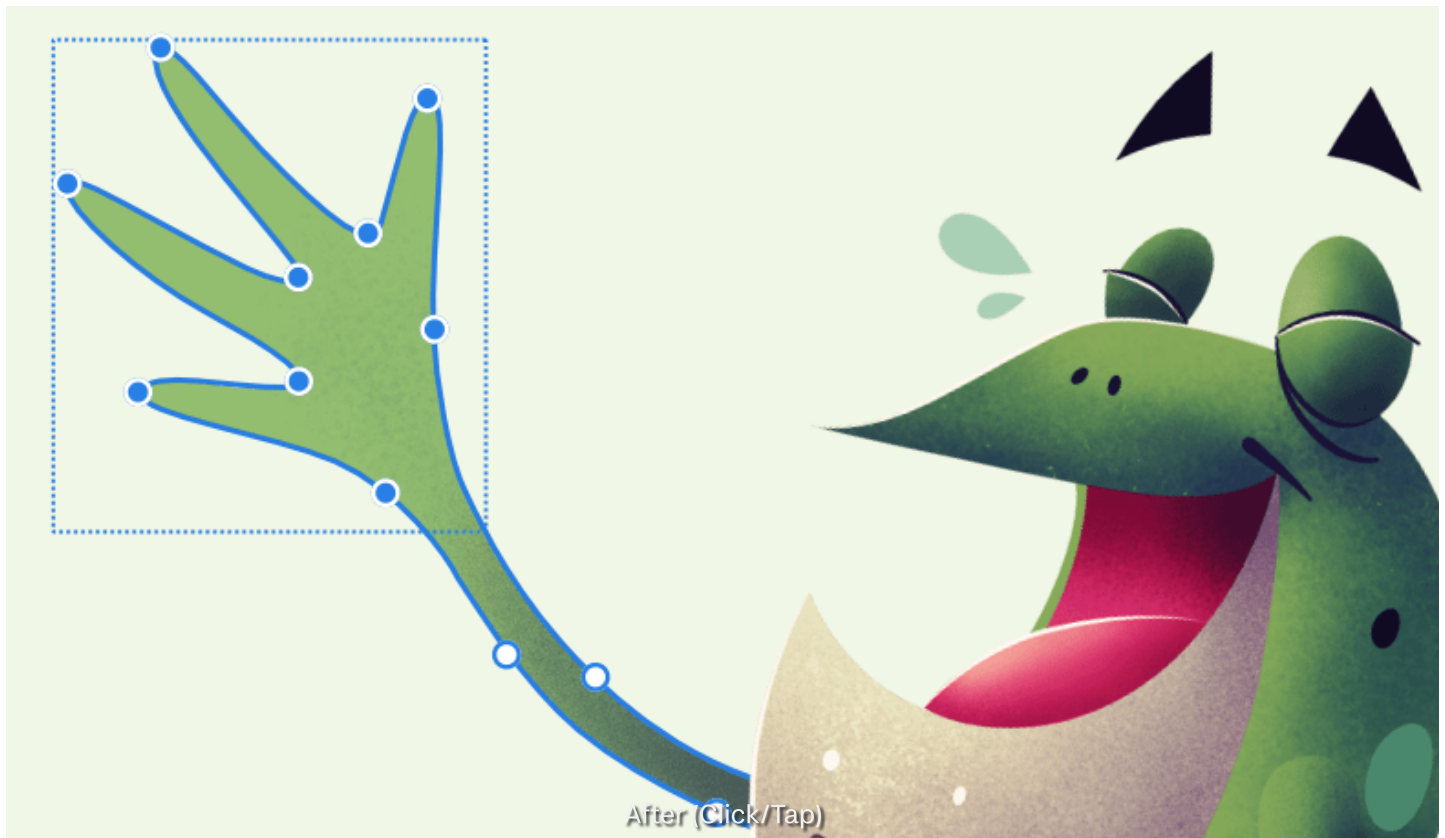
SEE ALSO:

[Node Tool](#)

[Transforming curves and shapes](#)

Transforming curves and shapes

Just as objects can be transformed, the nodes of curves and shapes can be transformed too.



Selection box around selected nodes being transformed

Node transformation works by forming a selection box around selected nodes. In doing so the box can be transformed in the same way that an object's selection box can be. As a result, the position of nodes relative to each other is altered in the transformation process which reshapes the curve or shape in different ways.

Many nodes can be transformed simultaneously or you can transform two selected nodes

 Transformation is possible on both two-dimensional and axonometric designs (e.g., isometric).

▼ To transform multiple nodes:

1. With the **Node Tool**, select one or more nodes on a curve or shape.
2. On the context toolbar, enable **Transform Mode** in the **Transform** section.
3. Resize, rotate and skew either directly on the curve or shape using selection box handles or use the **Transform** panel for absolute precision.

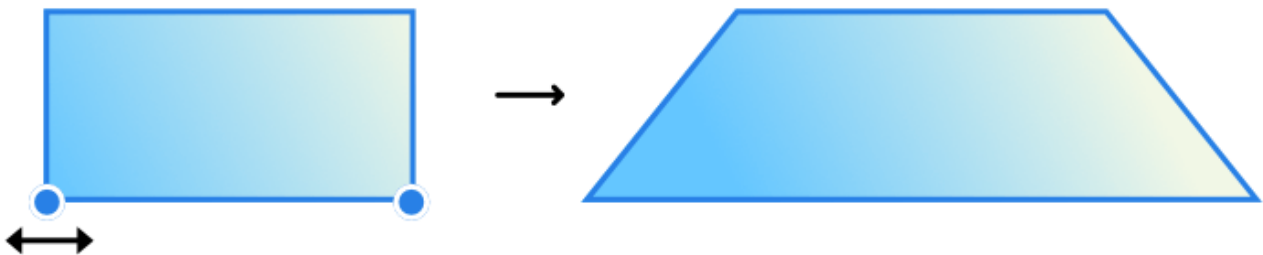
 With the **Transform** panel you can transform in relation to a configurable anchor point.

💡 The **Transform** section also offers some options to hide selection when dragging, switch on alignment handles within the selection box for more precise transforms, control selection areas to encompass all the curve outline and cycle the type of selection box.

▼ To transform shapes for a simple distortion effect:

1. Select two nodes on the shape.
2. Enter **Transform Mode**.
3. With the **Ctrl** key pressed, drag any selected node inwards or outwards.

This is particularly effective on simple shapes such as rectangles.



SEE ALSO:

[Node Tool](#)

[Selecting and aligning nodes](#)

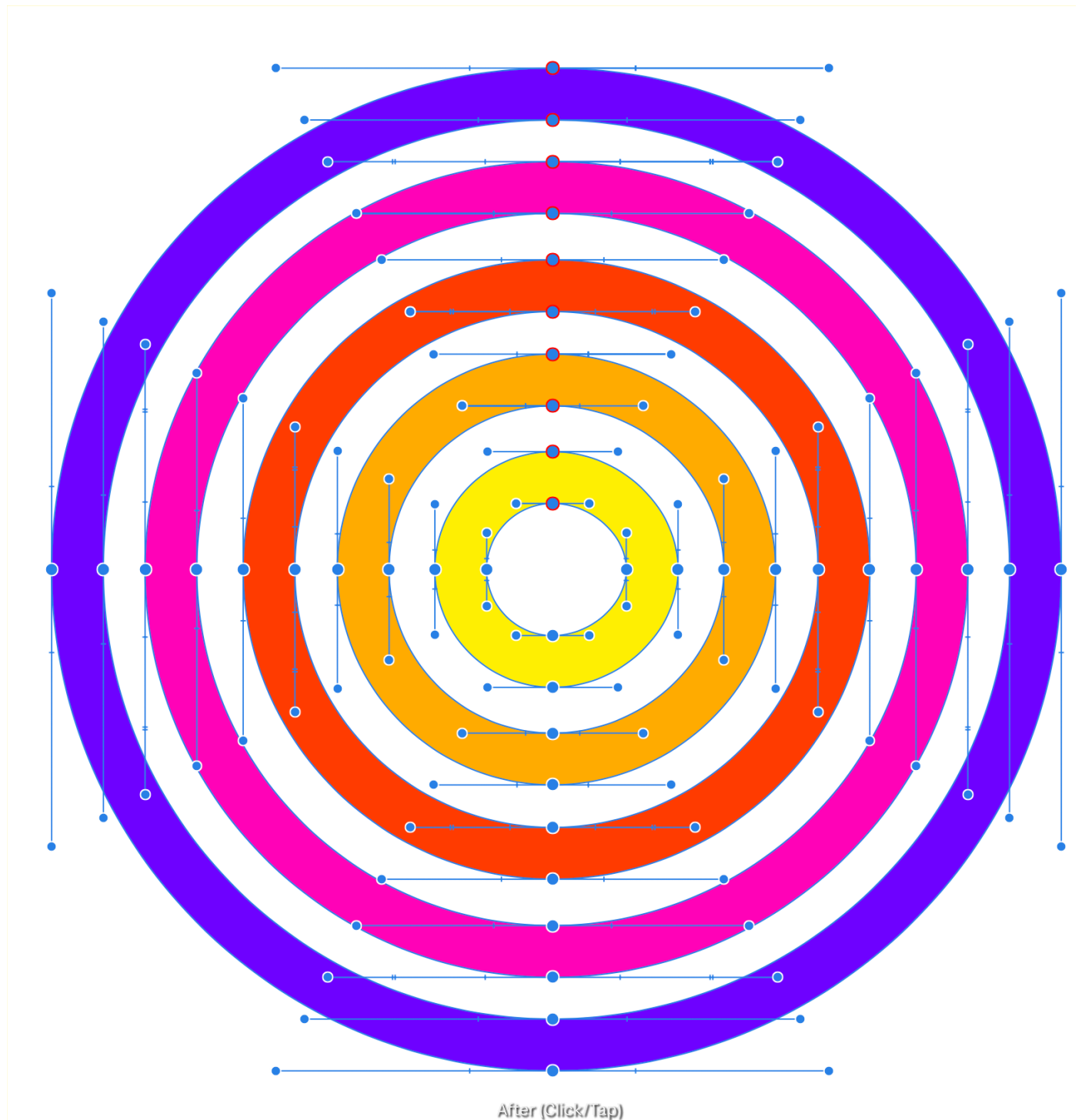
[Transforming objects](#)

[Transform panel](#)

[Keyboard shortcuts for transforming operations](#)

Expand stroke

Expand stroke expands the stroke of a shape or line, converting the line's boundaries into paths forming a closed shape.



Before and after expand stroke is applied.

Drawing a line creates an open path with a skeletal structure that can be adjusted. The boundaries of a line, on the other hand cannot be edited. Expanding the stroke converts the line's boundaries into paths forming a closed shape, so you can edit them individually in the same way as a regular shape.

The expand stroke feature has a range of uses. It can be used to:

- Modify the shape of strokes by adjusting its curves and nodes.

- Separate a shape into its two components: its stroke and fill (without stroke outline)
- Convert strokes to flattened shapes that can scale better as a flattened image, which looks more consistent across browsers.
- Flatten strokes prior to SVG export in web development.

▼ To expand a stroke:

1. Select the shape with either the **Move Tool** or the **Node Tool**.
2. Click **Expand Stroke** on the **Layer** menu.

The shape's stroke is now detached from the object and made into curves. As with **Convert to Curves**, the resulting curves can then be manipulated with the **Node Tool**.

 Pixel brush strokes, either as standalone strokes or on object outlines, cannot be expanded as they are based on pixels rather than being vector.

SEE ALSO:

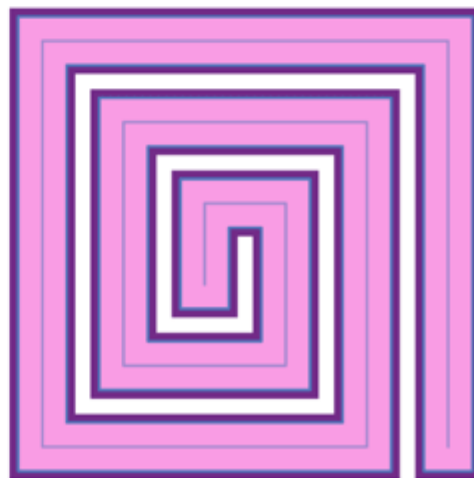
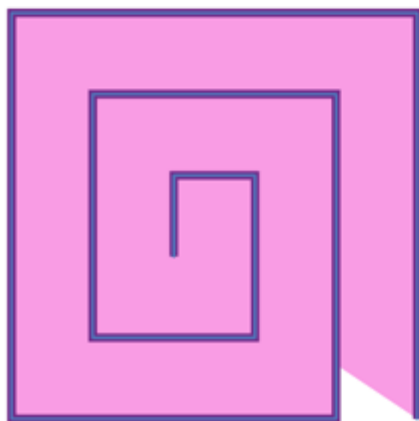
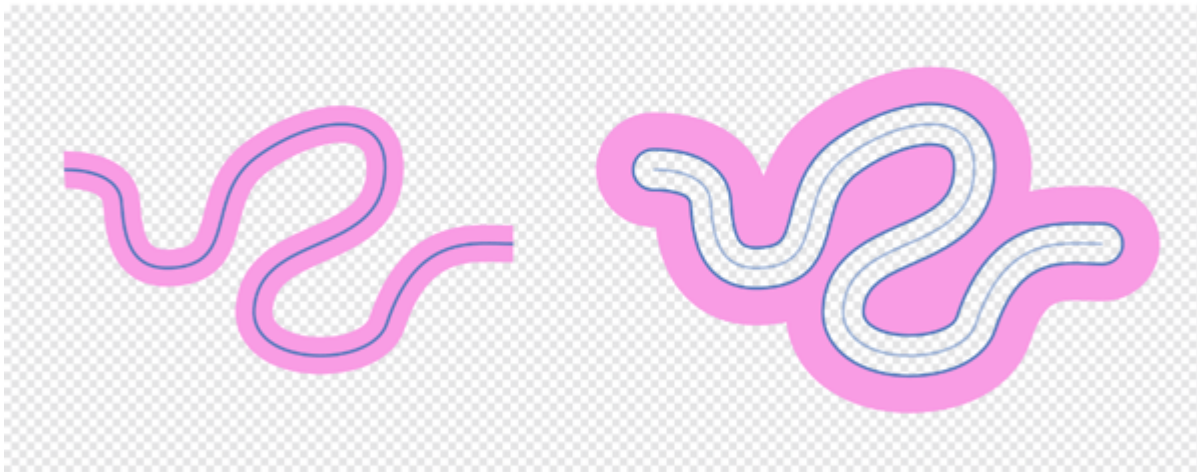
[About geometric shapes](#)

[Draw and edit shapes](#)

[Edit curves and shapes](#)

Contouring curves and shapes

Contouring lets you offset the object outline and stroke of a curve or shape non-destructively.



With contouring, the object outline can be grown or shrunk in relation to the original outline—if a stroke is applied to the object it will also appear offset as it follows the object outline.

You can control the size of the contour by dragging; the stroke will resize itself and be offset as you drag inwards or outwards. You can also adjust the stroke's joins and alter the fill type of a shape, making it hollow or closed.

The underlying geometry is outlined to offer a better understanding of the effects of contouring and to optionally help you edit your object with the **Node Tool**.

▼ To create a contour:

1. Select the **Contour Tool**.
2. With the curve or shape selected, drag left or right anywhere on the page to contract or expand the contour, respectively. For example, the more you drag right, increasing the radius, the more pronounced the contour.
3. (Optional) Adjust the context toolbar settings to:
 - Set a precise amount of contouring (**Radius**).
 - Control the join appearance of sharp nodes on the already contoured curve or shape (**Contour type**).
 - (With **Miter Joins** contour type selected) Adjust the extension of joins to create either sharp or flat corners.
 - Control the line ending appearance on curves (**Cap**).
 - Control how the shape is filled (see below).

▼ To make a shape hollow or filled:

1. Select the already contoured shape.
2. From the context toolbar, select a **Fill** option of **Force open**, **Force closed** or **Auto closed**. Auto closing will automatically keep open the interior area of an open curve, while shapes will automatically be kept closed; this setting can be overridden with the other options.

 The Force commands let you achieve different results, and change how the contour is performed.

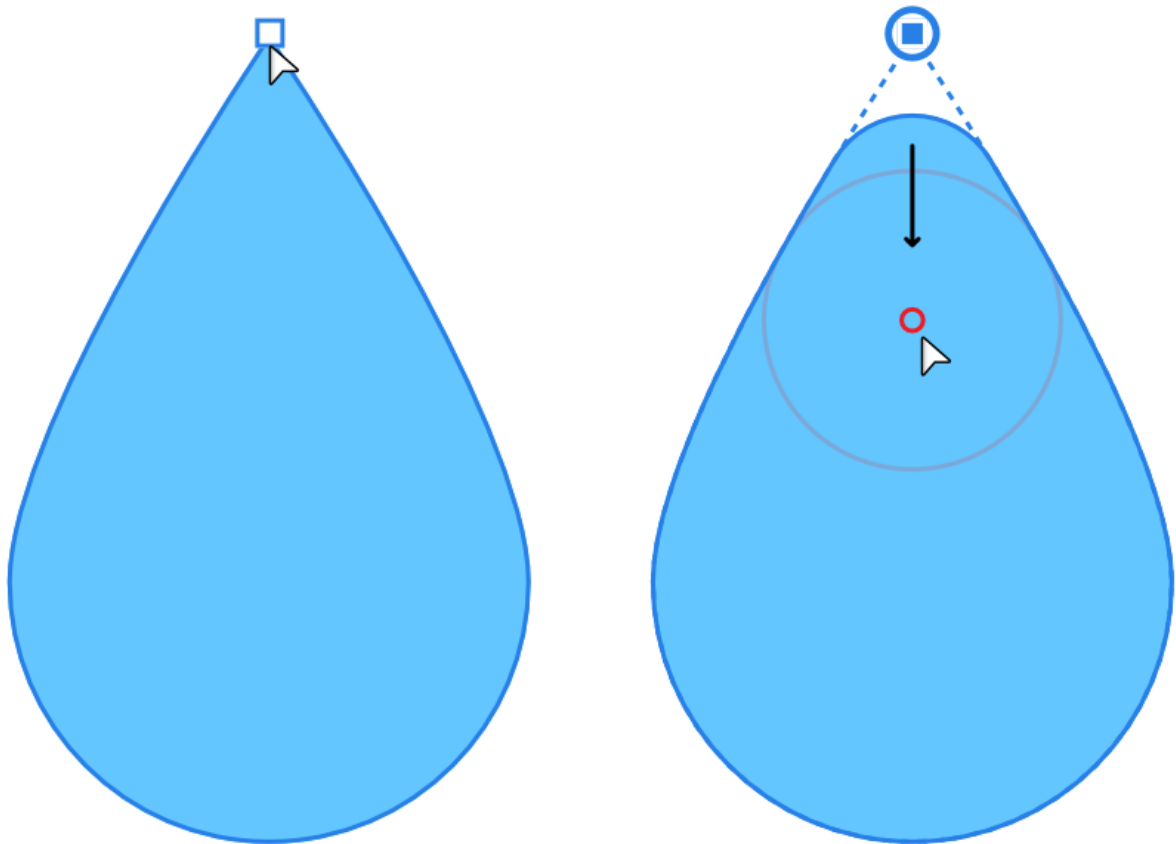
▼ To reset the contours:

1. Select the shape.
2. From the context toolbar, set the **Radius** option to 0 px.

SEE ALSO:

Cornering shapes

Cornering lets you selectively round sharp corners on closed shapes.



Ideal for rounding corners on geometric shapes or on closed shapes drawn with the Pen Tool, the Corner Tool lets you selectively apply cornering as and when you need it. A pre-requisite is that the corner must be a sharp corner, so geometric shapes such as polygons, stars, and triangles are great candidates for corner rounding.

Using an on-screen red "shaping" ring you can control the size of the corner by dragging; the corner will shape itself around the ring's circumference for precise and perfect results. You'll see the ring only as you drag from a sharp corner node.

▼ To create a rounded corner:

1. Select the **Corner Tool**.
2. (Optional) On the context toolbar, select a different **Corner Type** instead of **Corner Rounded** as default, e.g. Corner Concave.
3. Hover over the sharp corner node to be edited and drag inwards or outwards. A ring is shown around which the corner will be automatically adjusted. The more you drag, increasing the radius, the more pronounced the corner.

 You can apply corners simultaneously to multiple nodes that have been selected previously.

 Applying a corner to a shape created with any of Affinity's shape tools will convert that shape to curves. From that point, you won't be able to make use of the shape tool's inherent 'morphing' behavior.

▼ To edit a corner:

1. Select the shape.
2. With the **Corner Tool** active, click on the sharp corner node. (Although the corner is already rounded, the original shape's outline is retained.)
3. Drag the center of the ring to resize the corner as needed.



By default, the shape's outline is not affected by the tool (apart from at the corner). However, dragging the shape's outline with the **Ctrl** key pressed will reshape the shape; the corner radius is not affected by reshaping.



Modifier keys

The following modifier keys can be used as you adjust corners:

- To decrease or increase stroke width by percentage, use the [or] keys, respectively. For smaller absolute increments instead, use an additional **Shift** key modifier.

SEE ALSO:

[Corner Tool](#)

[About geometric shapes](#)

[Edit curves and shapes](#)

Fill modes

Shapes which have been constructed using self-intersecting lines can be filled in two different ways: **Alternate** or **Winding**.



Unfilled shape, and filled shapes showing Alternate and Winding fill modes, respectively.

 The last shape's red-line indicator leading up to the end node shows drawing direction. This is enabled by default to help identify the start node position and winding orientation—in this case, clockwise.

Fill mode is a property of any polycurve that has intersecting lines. Because a polycurve is a complex shape, what is considered inside and outside the shape can become unclear. The fill mode is an algorithm that decides the shape's inside and outside so that filling can be understood when exporting complex shapes to SVG document fragments for use in web apps.

- The **Alternative** mode determines whether a segment of the shape will be filled by drawing a ray from that point to infinity in any direction, and counting the number of segments within the given shape that the ray crosses through. If this number is odd, the segment exists in the fill region; if even, the segment is outside the fill region.
- The **Winding** mode determines whether a segment of the shape will be filled by drawing a ray from that point to infinity in any direction, and counting the number of instances in which a segment of the shape crosses the ray. Starting from zero, one count is added each time a segment crosses the ray from left to right and one count is subtracted each time a path segment crosses the ray from right to left, from the perspective of the ray. After the number of crossings has been counted, if the result is zero, then the point is considered to be outside the fill path. Otherwise, it is inside the path.

 Imported Adobe Illustrator objects will have the **Winding** mode set by default.

▼ To set Fill Mode:

- With the object selected, from the **Layer** menu, select an option from the **Fill Mode** submenu.

▼ To show the winding orientation:

- On the **Pen Tool** or **Node Tool**'s context toolbar, with **Show Orientation** on (default), the end of the segment leading up to the start node will show in red; the drawing direction is away from the red-line indicator.

SEE ALSO:

[About lines, curves and shapes](#)

[Edit curves and shapes](#)